

Proposed Amendments to the Commercial Harbor Craft Regulation for Crew and Supply Vessels Workshop



Sacramento

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California Environmental Protection Agency

Air Resources Board

Overview

- ◆ Background
- ◆ Crew and supply vessel proposed amendments
- ◆ Estimated emissions benefits
- ◆ Cost
- ◆ Funding opportunities
- ◆ Other proposed amendments



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Commercial Harbor Craft Regulation

- ◆ Board approved in November 2007
- ◆ Became effective November 2008
- ◆ Operational and new engine requirements for all commercial harbor craft
- ◆ In-use engine requirements for ferries, excursions vessels, tugboats, and towboats

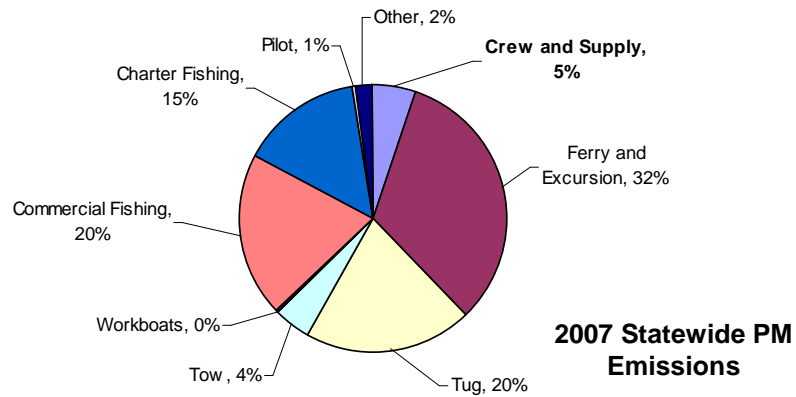
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Health Risk Assessment

- ◆ Port POLA / POLB Health Risk Assessment
 - Commercial Harbor Craft third largest contributor to risk behind ocean going vessel hotelling and cargo handling equipment
- ◆ POLA / POLB CHC Emissions Cancer Risk
 - >200 cases per million risk (5,000 residents)
 - >10 cases per million risk (1.5 million residents)
 - Significant source of PM mortality

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Crew and Supply Emissions are Small Portion of Statewide Harbor Craft Inventory



Crew and Supply Vessels Comprise a Small Portion of Total Fleet

District	# of Vessels		
	All CHC	C&S	C&S % of all CHC
Santa Barbara	183	13*	7%
Ventura	195	13*	7%
South Coast	750	20	3%
Bay Area	1,477	18	1%
Total	2,605	64	2%

*Number of vessels operating in Santa Barbara and Ventura equally divided between them

Crew and Supply Vessel Engine Annual Hours are High

Average Crew and Supply Survey Results	
# Vessels	64
# Propulsion Engines	152
Average Horsepower	523
Average Annual Hours	2462
# Auxiliary Engines	70
Average Horsepower	74
Average Annual Hours	3171

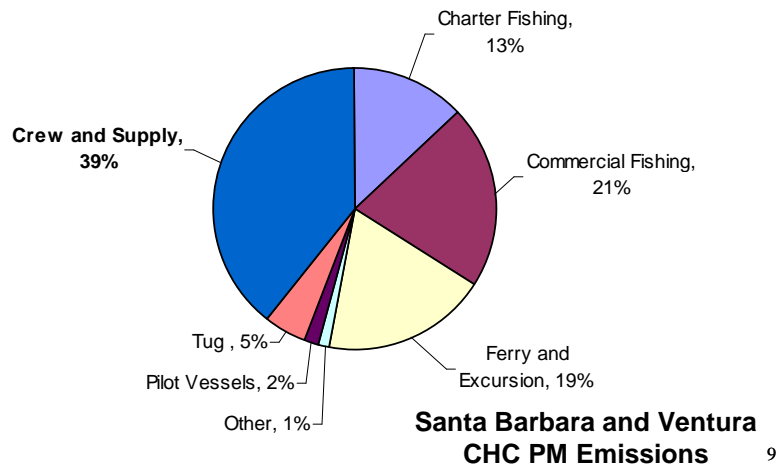
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Crew and Supply are Significant Part of Santa Barbara and Ventura's Harbor Craft Emissions

District	All CHC (tons/year)		C&S (tons/year)		C&S % of All CHC	
	PM	NOx	PM	NOx	PM	NOx
Santa Barbara	49	1,168	20	478	40%	41%
Ventura	51	1,206	20	478	39%	40%
South Coast	271	6,396	10.7	248	4%	4%
Bay Area	392	9,269	7.0	187	2%	2%

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Crew and Supply Largest Single Contributor to Santa Barbara and Ventura Harbor Craft Emissions



Crew and Supply Vessel Emissions Not Directly Controlled

- ◆ Local air districts permit of oil platforms include diesel engine emissions from associated crew and supply vessels
 - Neither vessel or vessel engines are individually permitted or controlled
- ◆ Operators may choose to reduce vessel emissions for mitigation credits
 - Source tests may be required as part of agreement

Proposing to Add In-Use Engine Requirements for Crew and Supply

- ◆ Similar to those for ferries, excursion vessels, tugboats, and towboats
- ◆ Phased compliance schedule brings oldest, highest use engines into compliance first
- ◆ Requires unregulated and Tier 1 engines to meet U.S. EPA Tier 2 or Tier 3 standards
- ◆ Compliance methods, engine model year determination, extensions, and alternative compliance plan all consistent with original regulation

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Compliance Methods Same as for Ferries, Excursion Vessels, Tugboats, and Towboats

- ◆ Replace with engine meeting current standard
- ◆ Demonstrate in-use engine meets standard
 - Tier 2 prior to Tier 3 effective date
 - Tier 3 when standard becomes effective
- ◆ Demonstrate in-use engine operates less than 300 hours annually



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Same Methods for Determining Effective Engine Model Year

- ◆ Engine's actual model year
- ◆ Engine's actual model year +5
 - If a diesel emission control strategy is employed that reduces the PM or NOx emissions by >25%
- ◆ Engine Tier 1 Rebuild Model Year
 - If Tier 0 engine was rebuilt to meet Tier 1 standards prior to January 1, 2010
 - January 1, 2008 for previously regulated vessel types

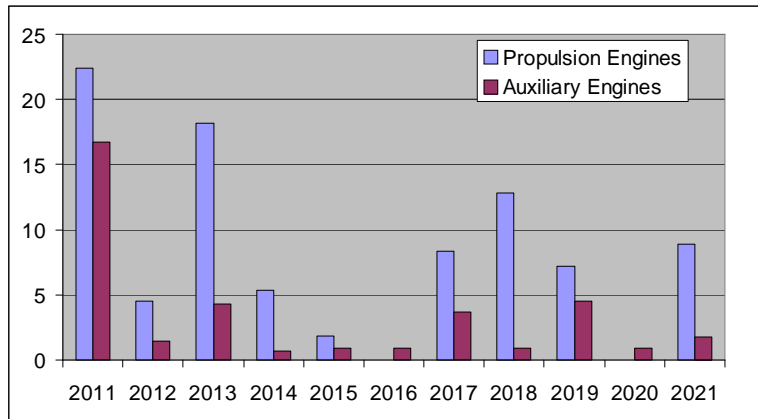
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Single Compliance Schedule for All Crew and Supply Vessel Engines

1985 and earlier (>1500 hours)	2011
1985 and earlier (>300 - <1500 hours)	2012
1986-1995 (>1500 hours)	2013
1986-1995 (>300 - <1500 hours)	2014
1996-2000 (>1500 hours)	2015
1996-2000 (>300 - <1500 hours)	2016
2001-2002 (>300 hrs)	2017
2003 (>300 hrs)	2018
2004 (>300 hrs)	2019
2005 (>300 hrs)	2020
2006 (>300 hrs)	2021
2007 (>300 hrs)	2022

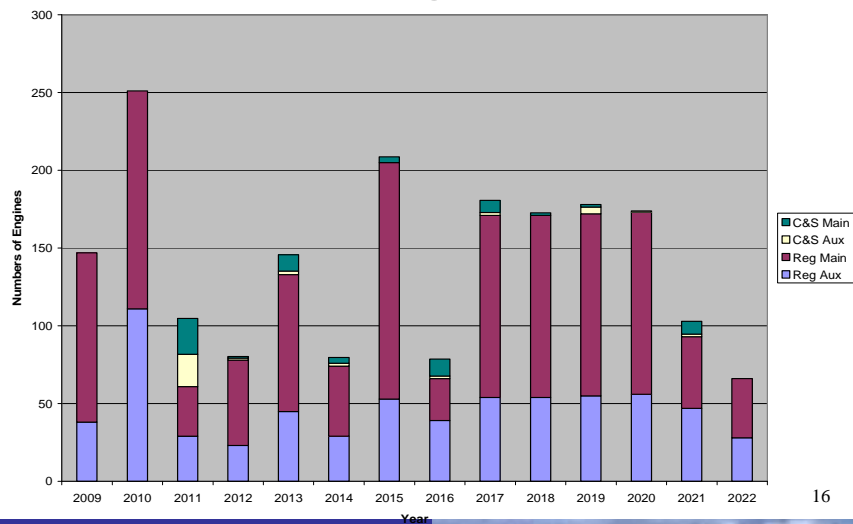
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Anticipated Crew and Supply Engines Required to Comply by Year



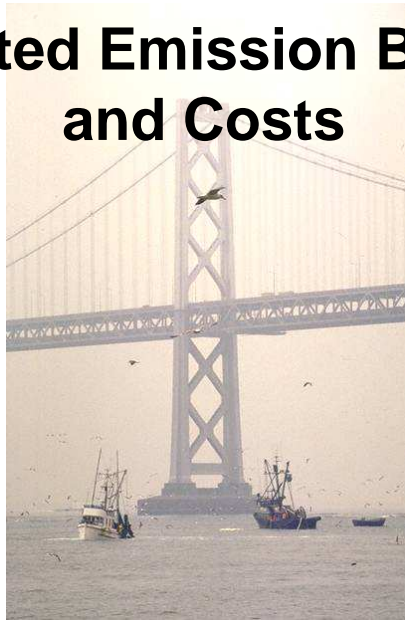
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Engine Numbers Small Compared to Previously Regulated Vessel Categories



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Estimated Emission Benefits and Costs



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Anticipated Emissions Benefits

- ◆ Total emissions reductions from crew and supply vessel engines over life of the regulation
 - 224 tons PM
 - 4,200 tons NO_x



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Santa Barbara and Ventura Gain Greater Share of Emission Benefits

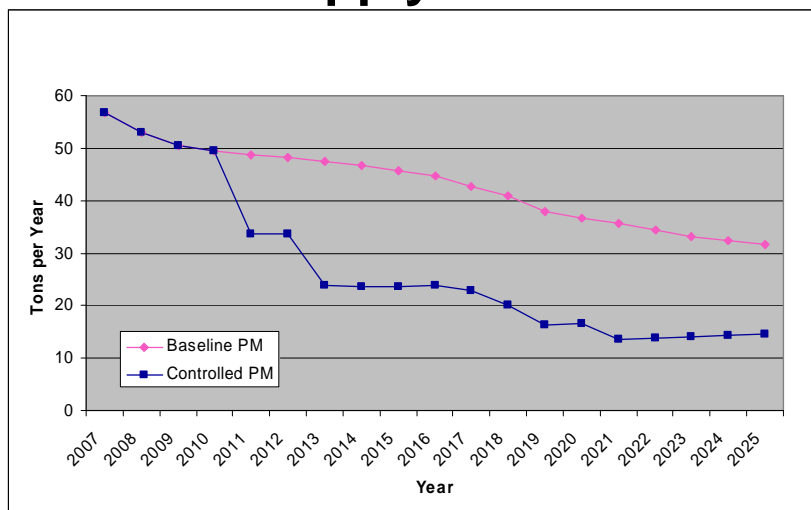
- ◆ Total emissions reductions from crew and supply vessel engines over life of the regulation in:

- Santa Barbara/Ventura
 - PM 155 tons
 - NOx 3000 tons
- South Coast
 - PM 35 tons
 - NOx 485 tons
- Bay Area
 - PM 34 tons
 - NOx 720 tons



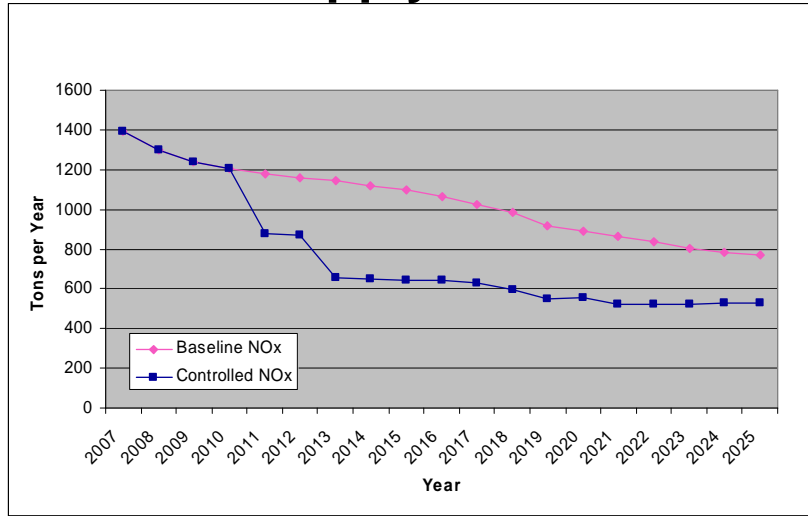
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Baseline and Controlled Statewide Crew and Supply PM Emissions



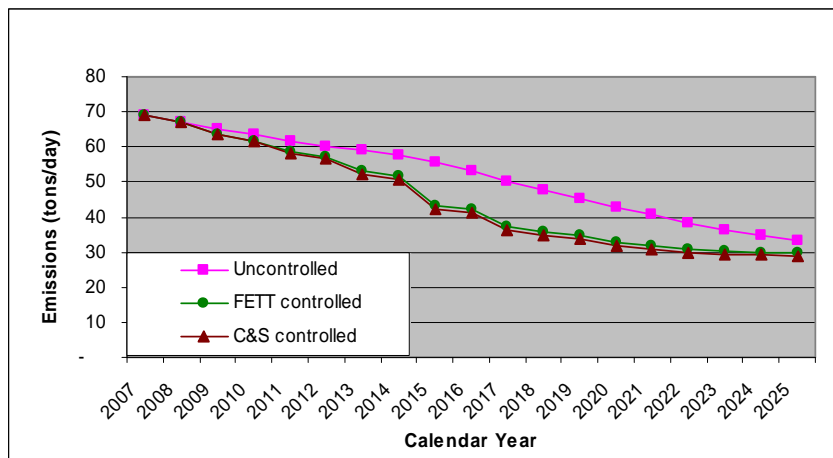
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Baseline and Controlled Statewide Crew and Supply NOx Emissions



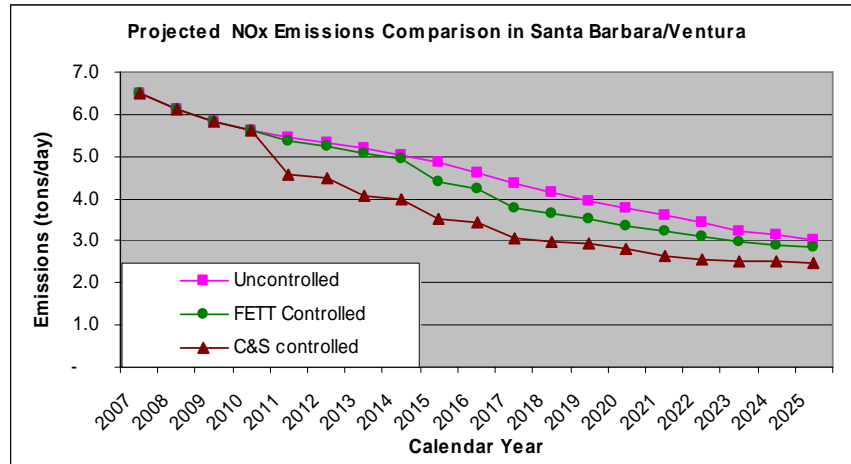
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Baseline and Controlled Statewide NOx Emissions for All Harbor Craft



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Baseline and Controlled Santa Barbara/Ventura NOx Emissions



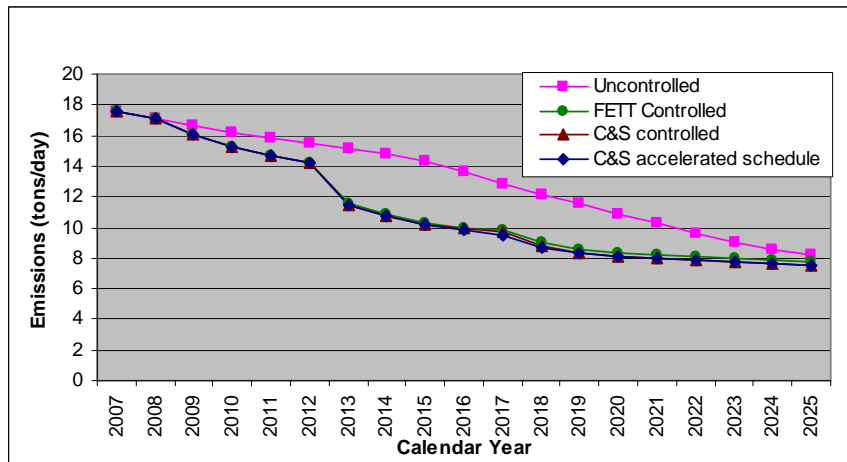
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Crew and Supply Emissions in SCAQMD Small Portion of Total

- ◆ Crew and supply vessel emissions:
 - 4% of South Coast commercial harbor craft emissions inventory and
 - 3% of vessels
- ◆ Accelerated South Coast compliance schedule would provide very little additional emissions reductions by 2014.

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Baseline and Controlled South Coast NOx Emissions



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Total Cost for Crew and Supply Vessel Engines

- ◆ \$8.5 million total regulatory compliance cost
- ◆ \$22.5 million total industry cost



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Estimated Engine Replacement Costs

Engine Category	Average Cost (\$/hp)
Propulsion Engine	\$270
Auxiliary Engine	\$233



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Crew and Supply Cost Effective Due to Large Percentage of Older Engines

Cost Effectiveness			
All Costs Attributed to PM (\$/lb)			
	Auxiliary Engine	Propulsion Engine	Overall
Ferry, Excursion, Tug, Tow	\$77	\$27	\$28
Crew and Supply	\$28	\$18	\$19
All Costs Attributed to NOx (\$/ton)			
	Auxiliary Engine	Propulsion Engine	Overall
Ferry, Excursion, Tug, Tow	\$11,818	\$3,370	\$3,560
Crew and Supply	\$3,527	\$1,916	\$1,997

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Funding Opportunities for Crew and Supply Vessels

- ◆ Require real, surplus, quantifiable, and enforceable reductions
- ◆ Carl Moyer Program
- ◆ Proposition 1B
 - Funding in specific trade corridors only:
 - Los Angeles/Inland Empire, Central Valley, Bay Area, and San Diego/Border
- ◆ Contact your local air pollution control district

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Other Amendments



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Other Amendments Crafted to Address Implementation Issues

- ◆ Availability of CARB diesel outside California
- ◆ Fishing vessels operating less than 300 annual hours as excursion
- ◆ Swing engines
- ◆ Clarifying amendments

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Availability of CARB Diesel Fuel Outside California

- ◆ Vessels traveling to California from outside the State
 - If CARB diesel not available for fueling prior to entering Regulated California Waters, amendment would allow:
 - U.S. EPA on-road diesel
 - U.S. EPA nonroad diesel (after June 1, 2010)
 - Both 15 ppm sulfur fuels
- ◆ Vessel operators must retain fuel records showing no availability of CARB diesel fuel

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Fishing Vessels Operating Engines Less than 300 Hours Annually As Excursion

- ◆ Provide exemption for fishing vessels operating less than 300 hours/year as excursion vessel
- ◆ Excursion vessels operating less than 300 hours per year are exempt from in-use engine requirements

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300 Hour Low Use Exemption to Apply to Hours Operating in Regulated Category

- ◆ Add language that any engine operating a total of 300 or more hours as a ferry, excursion vessel, tugboat, towboat, crew, or supply boat subject to in-use engine requirements
- ◆ Remove use of term “multipurpose vessel”

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Use of Swing Engines

- ◆ Some fleets keep a swing engine to rotate in and out of vessels to reduce maintenance down time
- ◆ Amend to require reporting and record keeping for swing engines
- ◆ Subject to in-use engine standards

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Other Proposed Amendments to the CHC Regulation

- ◆ Section (c)(7)(C) clarifying change
 - Section addresses applicability to portable engines
 - Replace “vessel engine” with “portable engine”
- ◆ Refine definition of temporary emergency/recue vessel
- ◆ Added required date to submit an Alternative Compliance of Emissions (ACE)
 - Feb. 28 of year the first ACE impacted engine is required to comply
- ◆ Clarify reporting requirement for vessel brought into California

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Remanufactured Engines

- ◆ Some operator's practice has been to trade engine in for a remanufactured engine rather than rebuilding engine in place
 - Reduces out-of-service time
 - Some remanufactured engines updated to be cleaner than original engine
- ◆ No prohibition on rebuilding engines
- ◆ But replacement of engine allows only engines meeting the current model year standard engine
- ◆ Should reg be amended to allow this practice?

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Questions



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