

California Marine Engine Emissions Inventory and Pleasure Craft Survey

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Introduction

- California ARB continually looking at marine engine/boat emissions reductions
 - Catalyst based outboards
 - More stringent EVAP controls
 - Refueling standards, active vapor recovery
 - Chemical disclosures, labeling requirements
 - Detailed applications

“California has the worst air quality in the country”

Introduction

- But just how meaningful are these proposals and what affect with they have on the overall air quality/emissions inventory in CA?

Introduction

- With some of our industry data, together with CA pleasure craft survey/registration data
 - Leverage this information to potentially make a much more meaningful contribution to emissions reduction

Pleasure Craft Survey

- Conducted by the Institute for Social Research
California State University
 - Approximately 1150 participants in survey
 - Targeted participants based on DMV and Coast Guard registration information

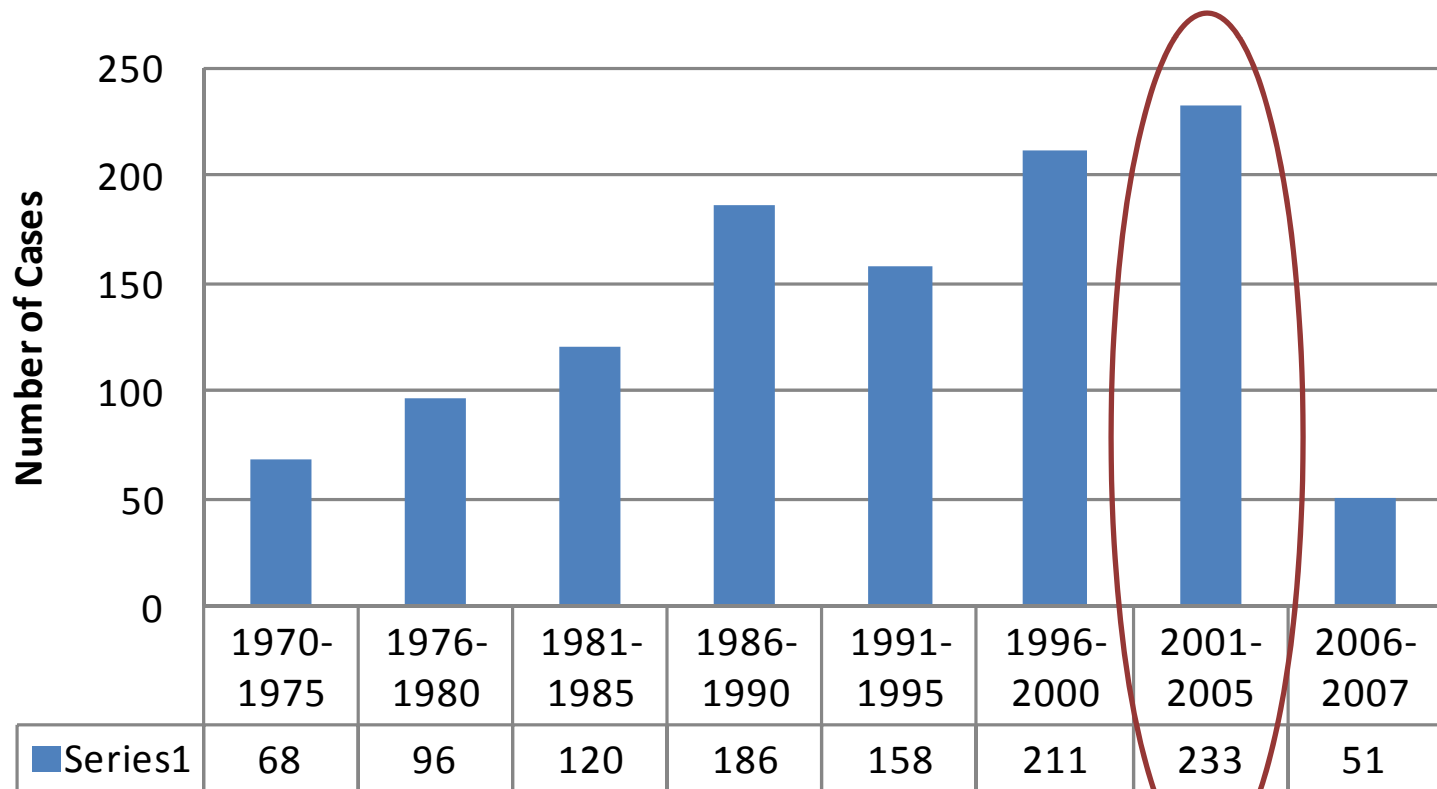
Pleasure Craft Survey

- Questions included:
 - What year is your boat?
 - Carbureted or fuel injection?
 - What material is fuel tank?
 - How many days did you operate your boat ?
 - ...About 32 questions in total

Pleasure Craft Survey Results

- Nearly 21% of the boats were from Model Year 2001-2005

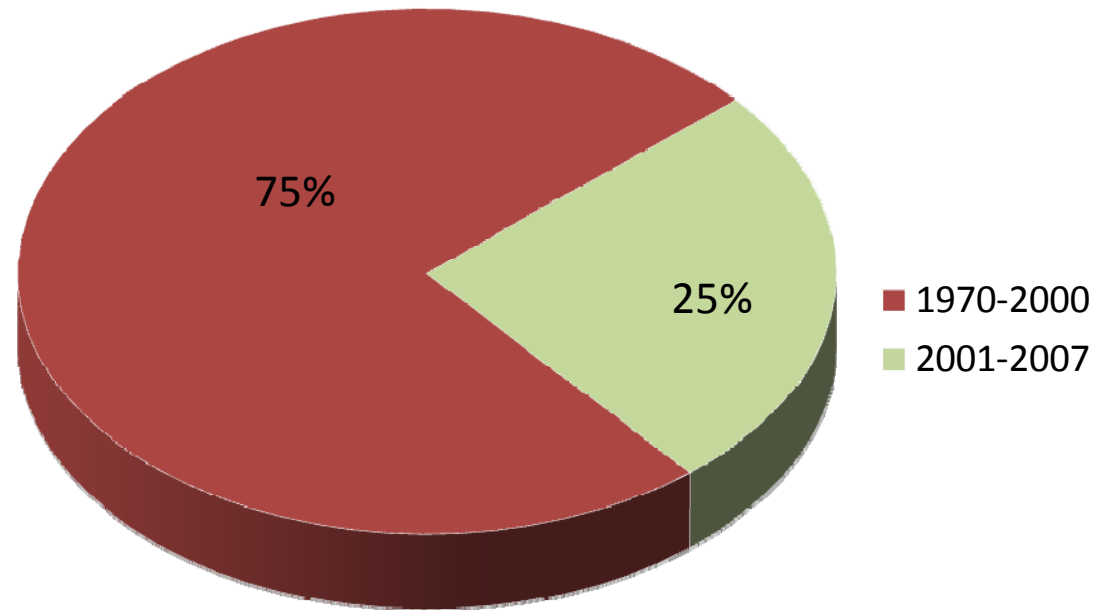
Model Year of Pleasure Craft



Pleasure Craft Survey Results

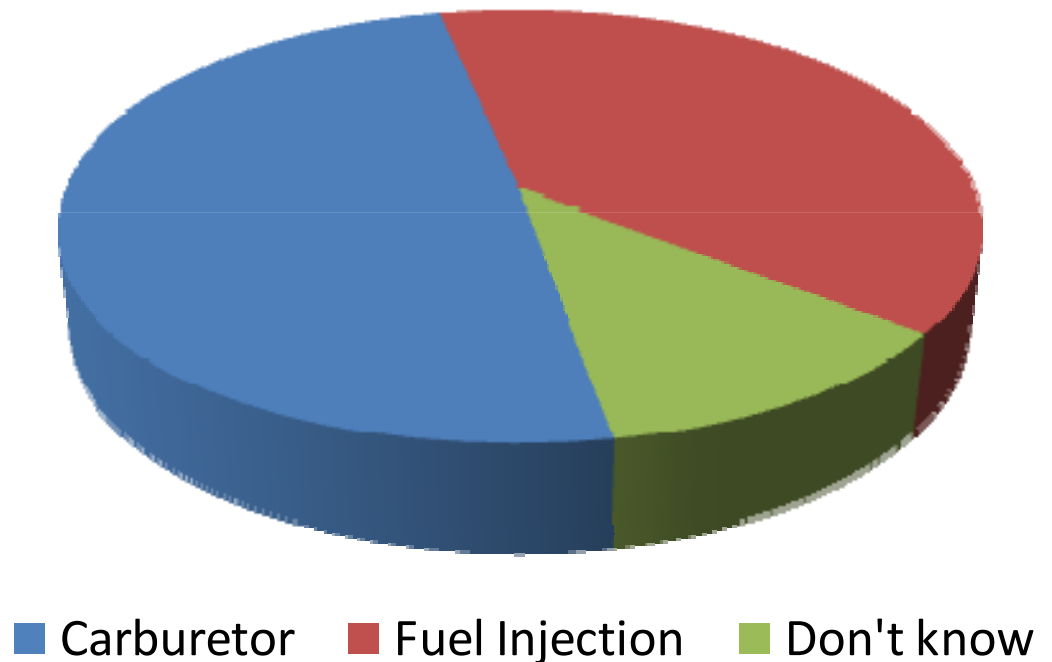
- Data can be approximately split into old technology and new technology
 - 1970 to 2000
 - 2001 to 2007

Results of California Survey - Age of Pleasure Craft



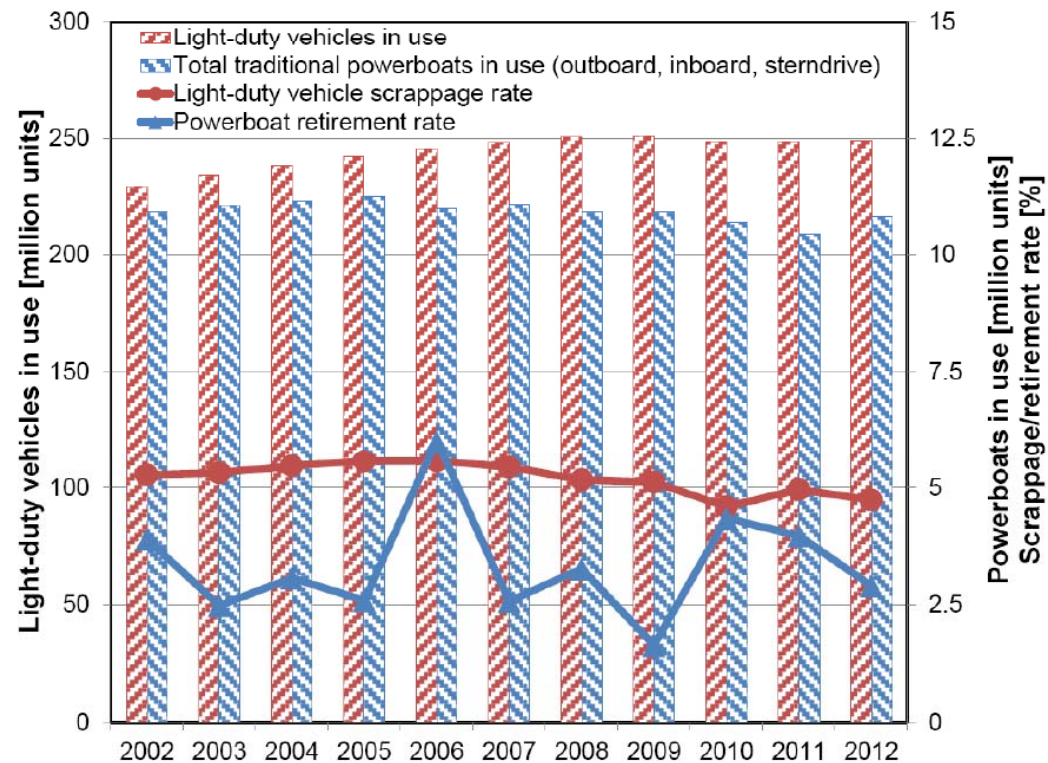
Pleasure Craft Survey Results

- Approximately 50% of engine population use carburetors



Engine Retirement Rates

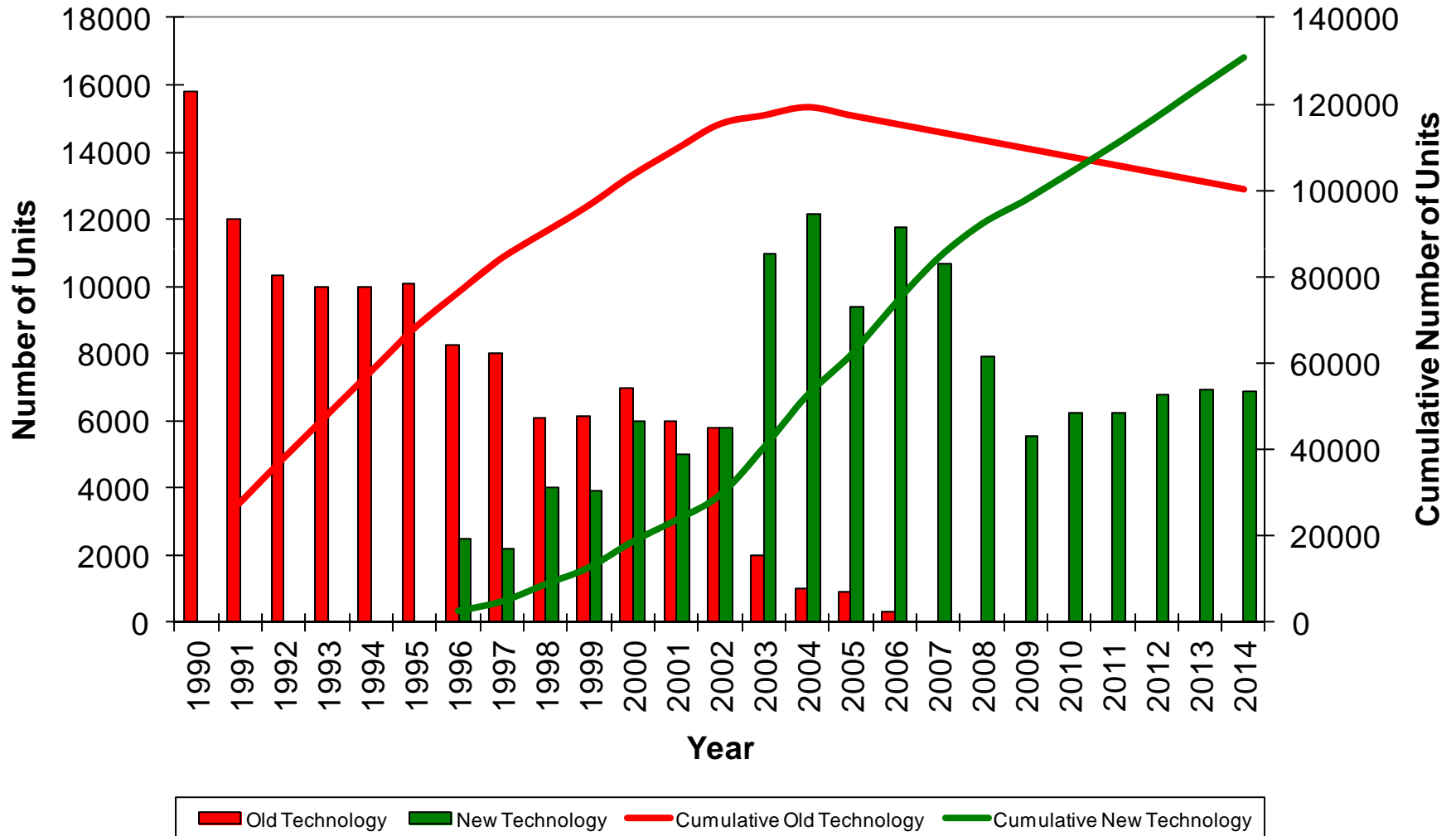
- Data from NMMA and the National Automobile Dealers Association
- Average powerboat scrapping rate: ~2.5% compared to 5% for automotive



1. National Automobile Dealers Association (NADA), NADA Data State of the Industry Report. 2013.

2. National Marine Manufacturers Association (NMMA), 2012 Recreational Boating Statistical Abstract. 2013.

California Outboard Engine Sales (Old Technology and New Technology) 1990-2014

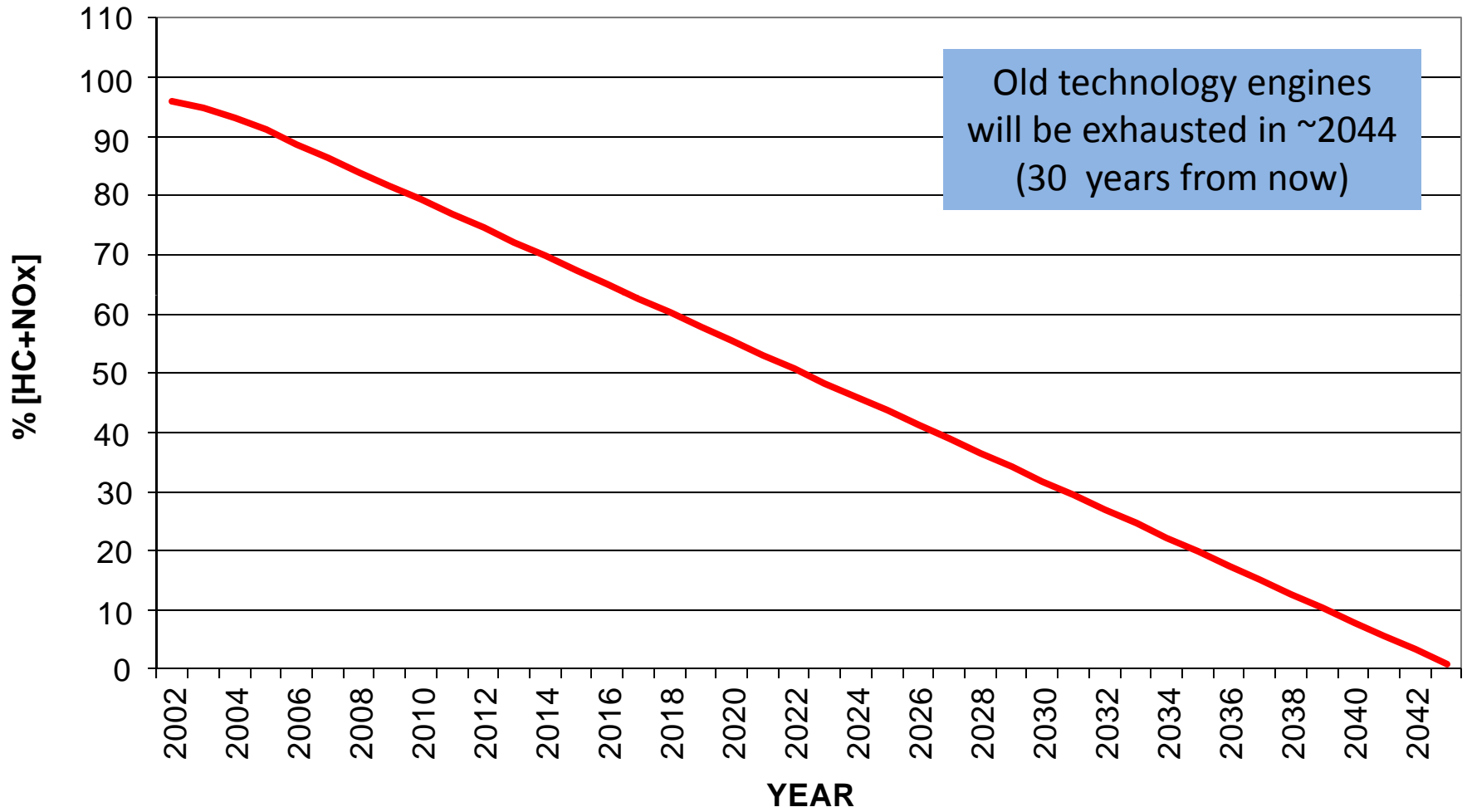


Assumptions

- Average engine 85HP (64kW) ICOMIA 12kW
- Average old technology HC+NO_x 130g/kW-hr
- Average new technology HC+Nox 16g/kW-hr
- 35 hours/year operation
- 2.5% engine retirement rate

Attempt to understand to overall impact of old and new technology on the CA inventory

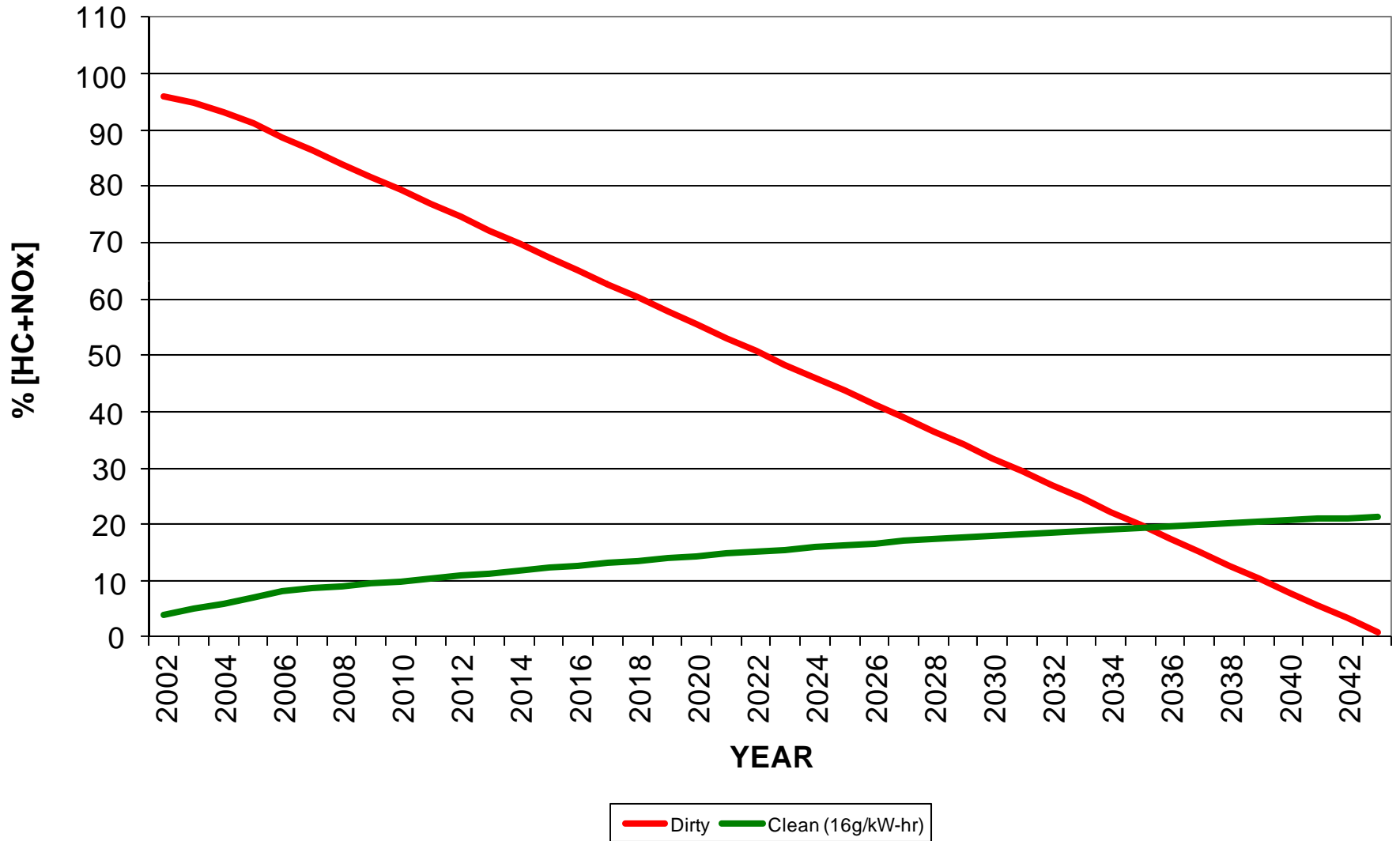
Emissions Inventory Projection (HC+NOx) Outboard Engines



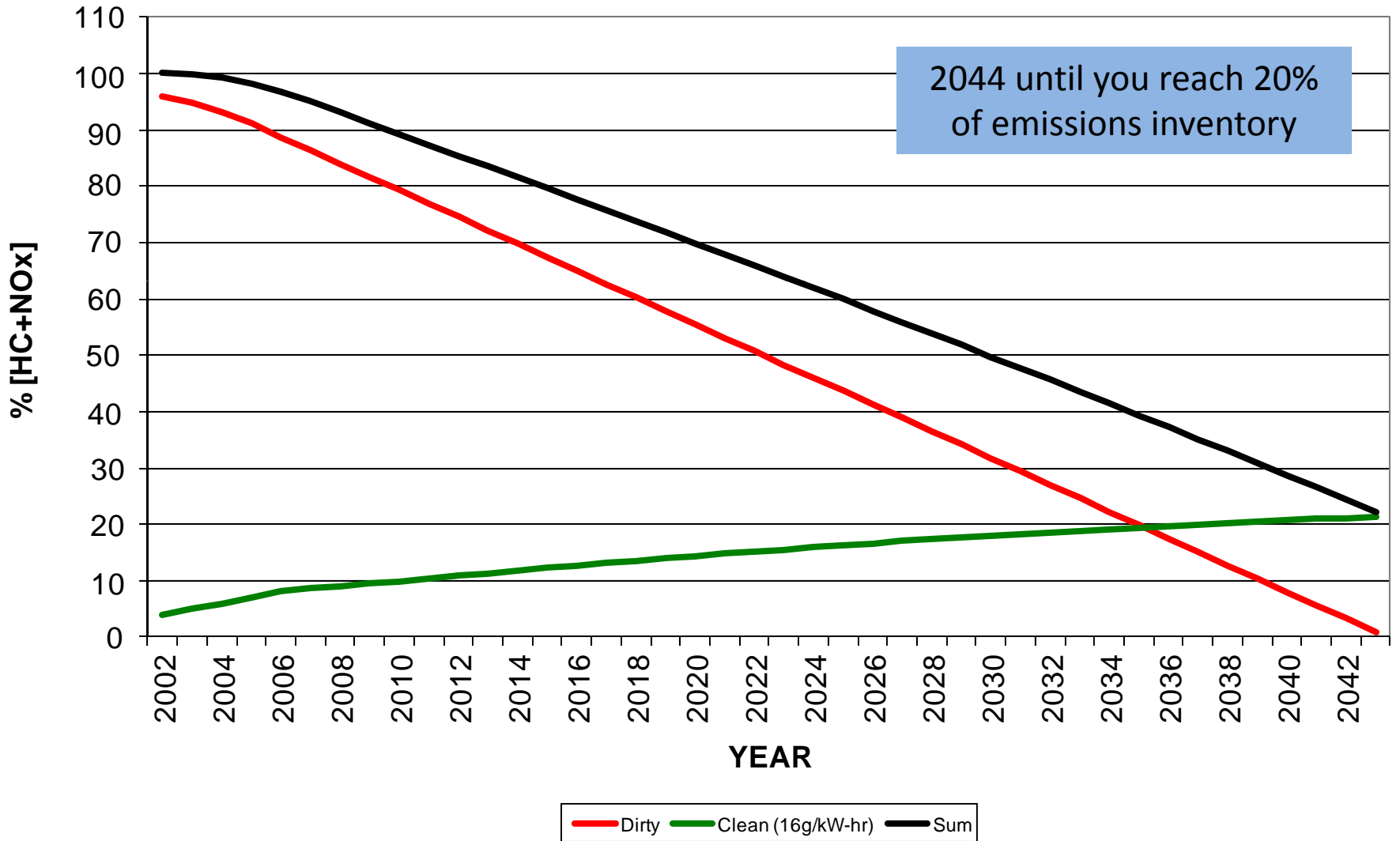
Normalized tons of emissions

Dirty

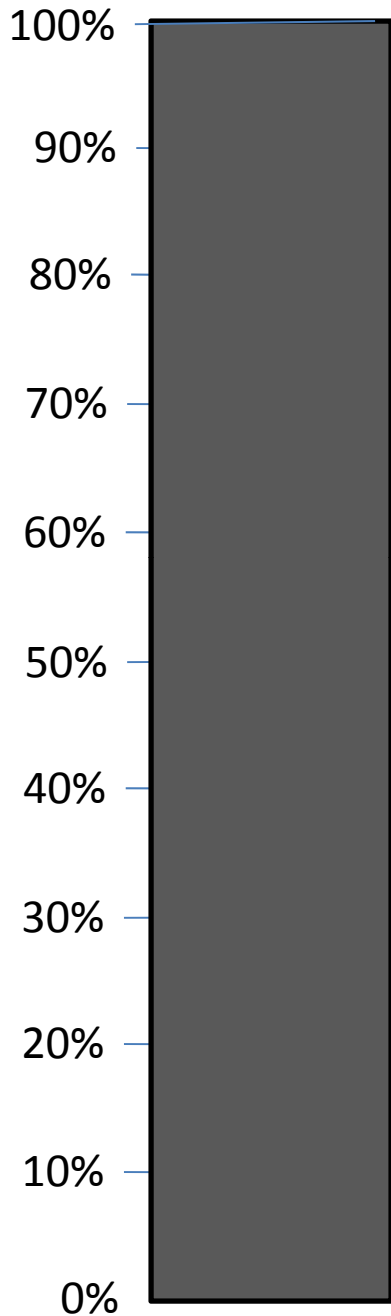
Emissions Inventory Projection (HC+NOx) Outboard Engines



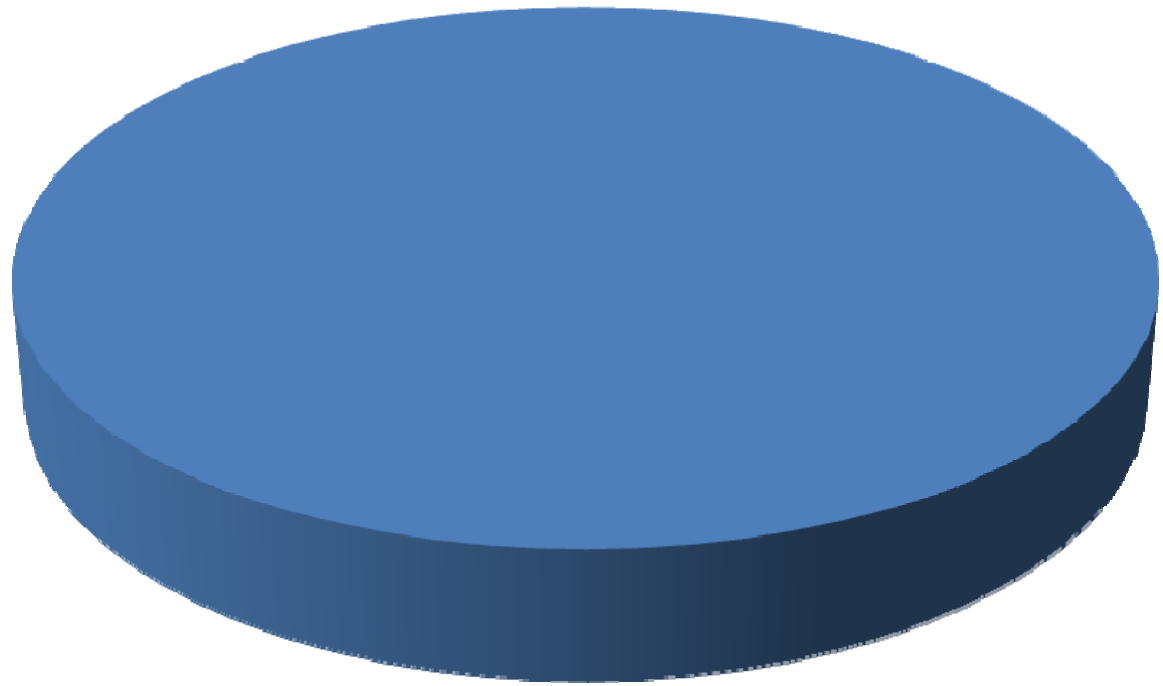
Emissions Inventory Projection (HC+NOx) Outboard Engines

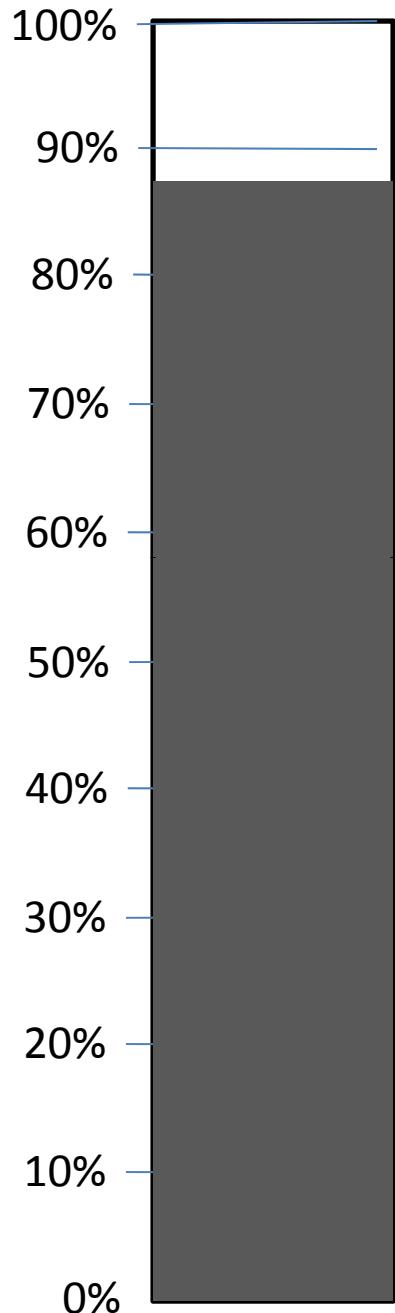


2015 – CURRENT EMISSIONS INVENTORY



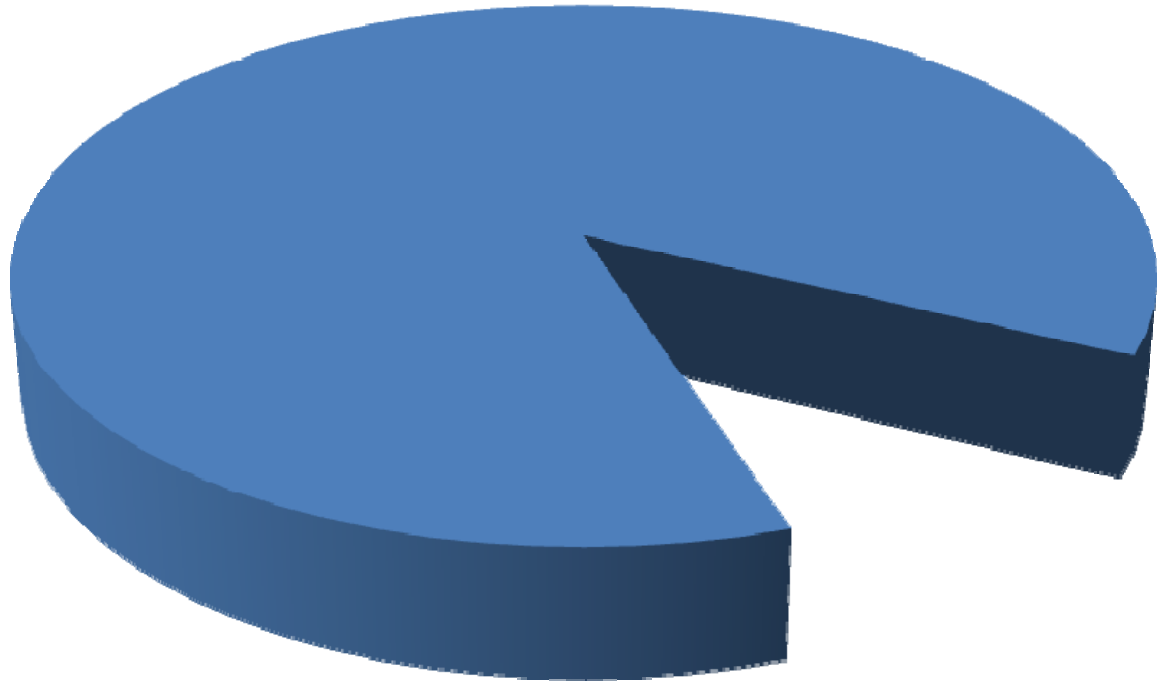
Total HC+NOx Emissions [%]





2019

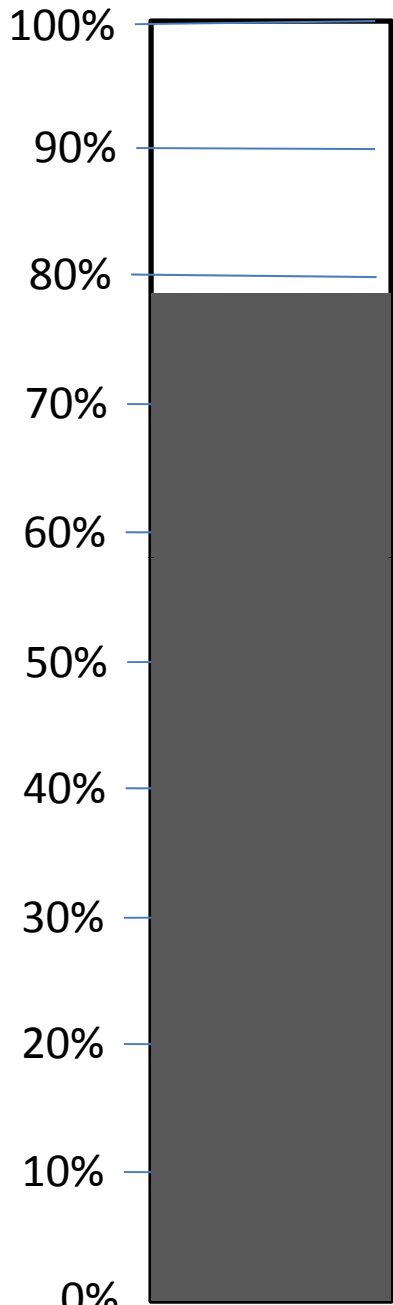
- Do nothing but sell current engines
- Emissions will be reduced by 13%
- (In 5-years, fewer old technology engines)



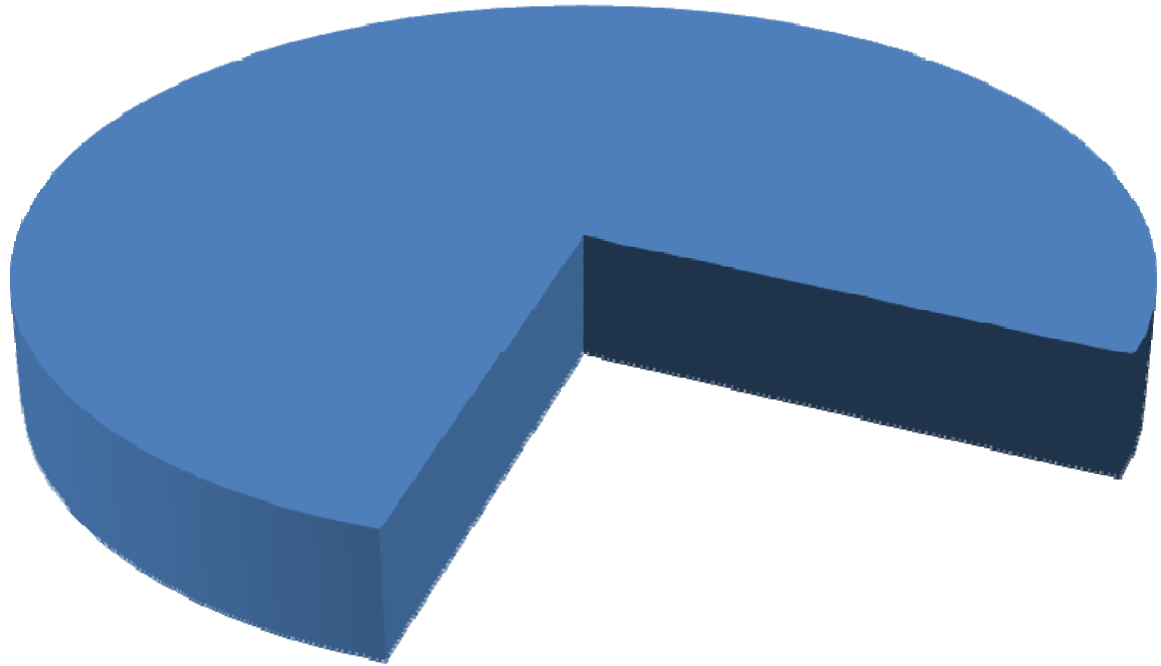
Total HC+NOx Emissions [%]

2019

- More stringent emissions standards TODAY (100%)
- 13% from old technology retirement; 10% from lower emissions engines

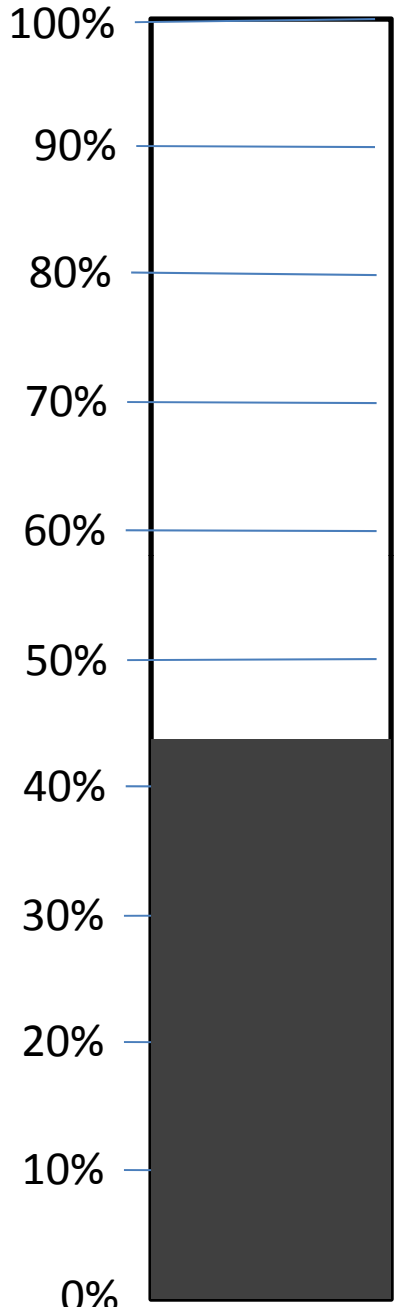


Total HC+NOx Emissions [%]

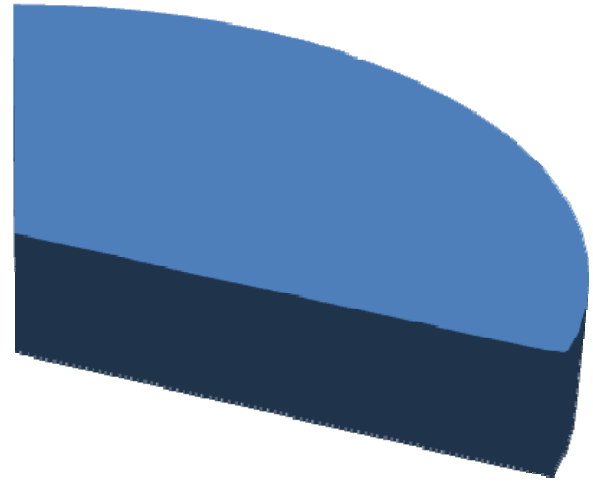


2019

- Engine Incentive Program for 3 years...
- **Potential to reduce emissions by 55%**



Total HC+NOx Emissions [%]



Summary

- Leverage this data when faced with increased regulation
- Increased sales of 15% to 20% and retirement of older technology engines will make a very meaningful impact
- Next steps – explore feasibility of an incentive program/regulatory framework to support such a program

Overview of Major California Air Pollution Incentives, Grants, and Credit Programs

Participation in these incentive programs is open to all California residents or businesses that meet program eligibility criteria. The amount of funding available to each program is subject to budgetary limits. The basis for selecting the projects to be funded varies among programs – some are competitive based on potential emission reductions, and others distribute funds to eligible projects on a first-come, first-served basis as long as the program funds are available.

Information about the full range of air quality incentive programs is available on ARB's website, www.arb.ca.gov, under Resources => grants/incentives. General information about heavy duty truck subsidies is also available from ARB's hotline at 1-866-6-DIESEL (1-866-634-3735).

Program Type	Description	Forms Available At
Zero-Emission Automobile Purchase Subsidies	Rebates to Californians for the purchase of zero emission and plug-in hybrid light-duty vehicles.	California Center for Sustainable Energy: http://www.cvrp.energycenter.org toll free: 1-866-984-2532
Hybrid Truck and Bus Purchase Subsidies	Vouchers to help accelerate deployment of eligible new hybrid and zero emission trucks and buses.	Participating Dealers: http://www.californiahvip.org/dealerlist.asp toll free: 1-888-457-4847 email: info@californiahvip.org
On-Road Heavy Duty Diesel Truck Subsidies	Grants and loan assistance available to California-based fleets of 3 or fewer trucks for truck replacement or retrofit.	Participating dealers or retrofit installers: http://www.arb.ca.gov/msprog/moyer/vocher/dealerlist/dealerlist.htm Dealer information also available from ARB at (916) 322-1520 or (toll free) 1-866-6-DIESEL (1-866-634-3735)
Local Air District Vehicle and Equipment Incentive Funds	Incentives for replacing or retrofitting older engines to cleaner-than-required emission levels. Eligible projects include cleaner on-road, off-road, marine, locomotive and agricultural engines.	Local Air Districts: http://www.arb.ca.gov/msprog/moyer/voucher/dealerlist/dealerlist.htm Additional information also available from ARB at (toll free) 1-866-6-DIESEL (1-866-634-3735)

<p>Consumer Assistant Program (CAP)</p>	<p>Incentive to retire and scrap currently registered CA automobiles; repair assistance tied to household income eligibility.</p>	<p>Department of Consumer Affairs: toll free: 1-866-272-9642</p> <p>http://www.bar.ca.gov/80_BARResources/01_CAP&GoldShield/Factsheets/Website%20CAP%20FAQs.pdf</p>
<p>Vehicle Buy Back Program</p>	<p>Incentive for scrapping currently registered, road-worthy, older California automobiles.</p>	<p>Currently available in the following air pollution control districts:</p> <p>Antelope Valley Air Quality Management District (Northeast portion of Los Angeles County). For more information, visit www.avagmd.ca.gov, or call 1-800-717-7624</p> <p>San Luis Obispo Air Pollution Control District For more information, visit the San Luis Obispo APCD website at http://www.slcleanair.org or call the Vehicle Buy Back Program at 1-800-717-7624</p> <p>Mojave Desert Air Quality Management District Includes the northern portion of San Bernardino County and Eastern portion of Riverside County. For more information visit http://www.mdagmd.ca.gov or call the Vehicle Buy Back Program at 1-800-717-7624.</p> <p>Districts currently on hold:</p> <p>Santa Barbara County Air Pollution Control District</p> <p>Bay Area Air Quality Management District</p> <p>South Coast Air Quality Management District</p>