Proposed AB 32 Discrete Early Action Regulation:

California's Approach to Reduce Emissions from Small Containers of Automotive Refrigerant

January 22, 2009

California Environmental Protection Agency
AIR RESOURCES BOARD

High-Global Warming Potential Greenhouse Gas Sector in AB 32

- **High Global Warming Potential (GWP) Greenhouse Gases (GHG) include**
  - Hydrofluorocarbons (HFC)
  - Perfluorocarbons (PFC)
  - Sulfur hexafluoride (SF_6)
- **High-GWP GHG emissions in CA**
  - 3 $MMTCO_2E$ in 1990
  - 15 $MMTCO_2E$ in 2004
  - 47 $MMTCO_2E$ in 2020 (BAU)
- **~20 $MMTCO_2E$ sector emission reductions by 2020 in Scoping Plan**

AB 32 Scoping Plan Measures for the High-GWP GHG Sector

- **Mobile Source Strategies**
  - Small cans of HFC (today's regulation, 2009)
  - Refrigerant recovery at end of equipment/vehicle life (2009)
  - Pavley II: Improve system efficiency and use of low-GWP refrigerant alternatives
  - Vehicle AC system leak check and repair
- **Stationary Source Strategies**
  - Limit high-GWP use in consumer products (adopted 6/2008)
  - SF_6 limits (utilities, tracer studies, etc.) (2009)
  - Fluorinated gas reduction in the semiconductor industry (2009)
  - Refrigerant management program (2009)
  - Alternative suppressant in fire protection systems
  - Foam recovery and destruction program
  - Residential refrigeration early retirement program
- **Mitigation fee on high-GWP GHGs**

Motor Vehicle Air Conditioning (MVAC)

12 oz can

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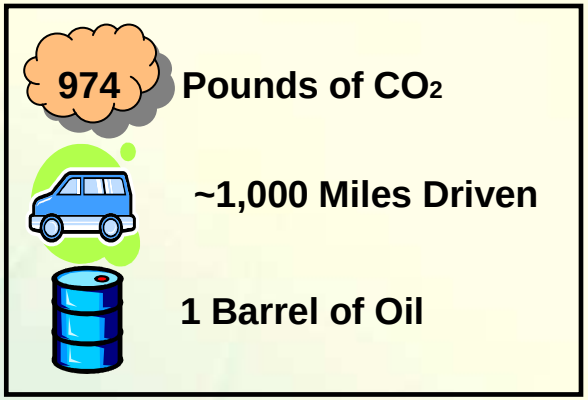
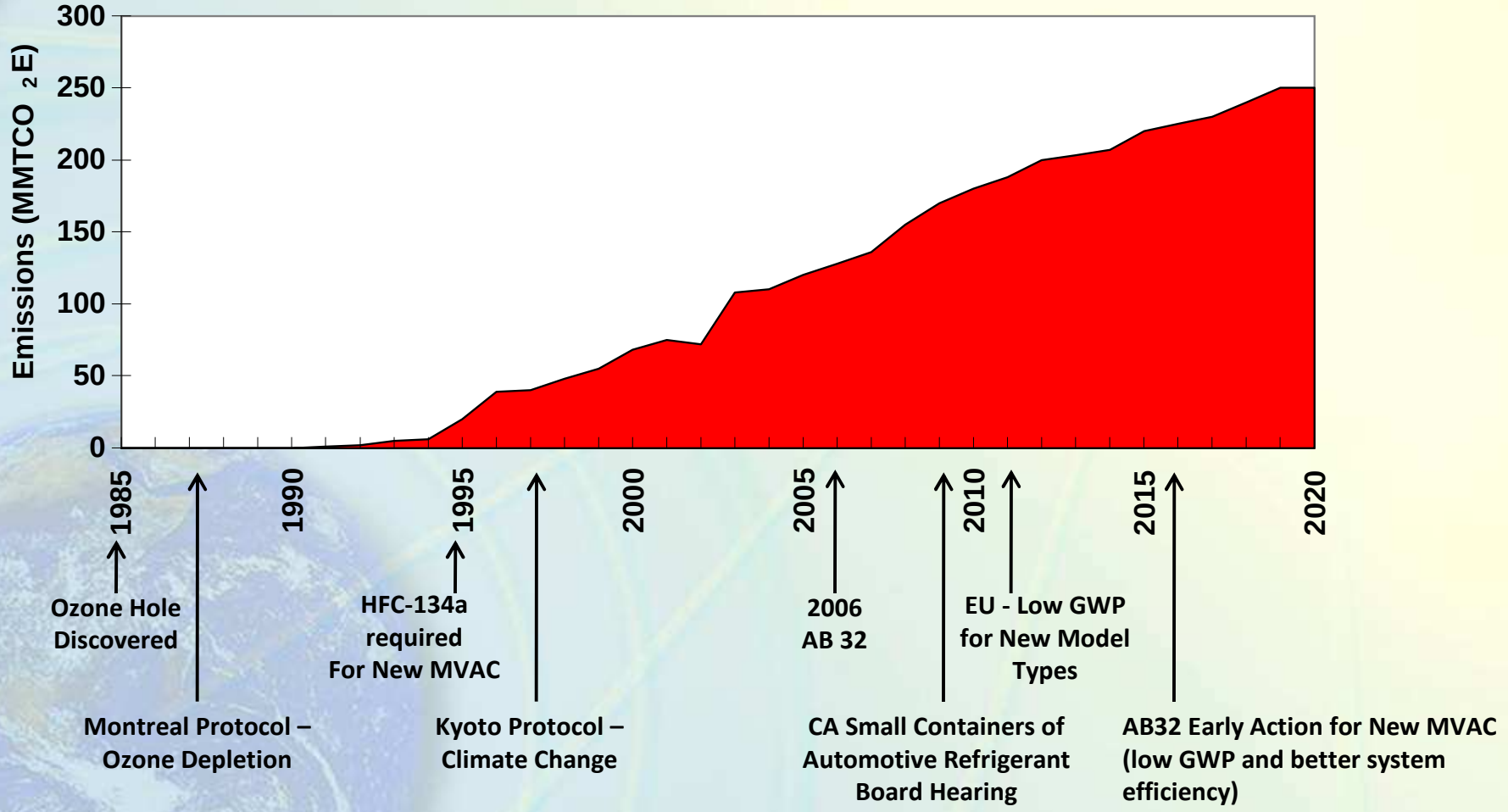
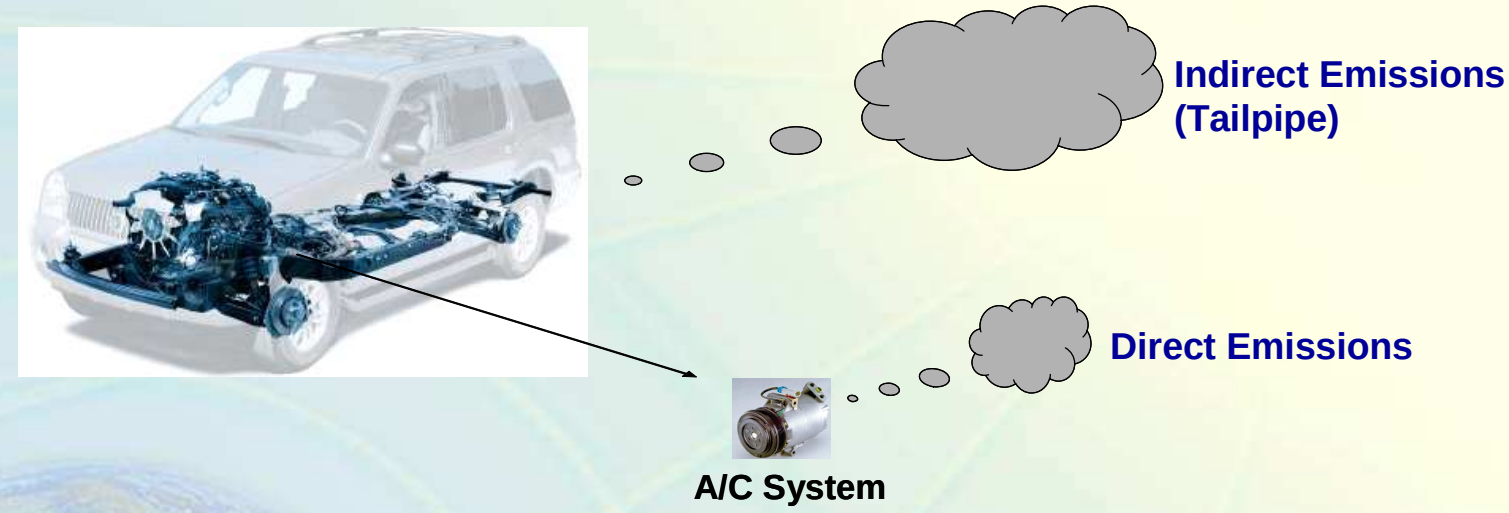


Most common current refrigerant, HFC-134a, has 1,300 times the global warming potential of carbon dioxide (CO_2)

Global MVAC HFC-134a Emissions



MVACs Contribute to Global Warming in Two Ways



- **Direct emissions**: normal leakage, servicing, end of life, and accidental breach
- **Indirect emissions**: tailpipe emissions of CO_2 and other pollutants due to A/C operation and weight

AB 32 Comprehensive Suite of Strategies for Refrigerants

- **For new vehicles:**
  - Pavley GHG Emissions Standards (AB 1493, 2004)
  - Environmental Performance Label (2007)
  - Cool paints/windows glazing (2009)
  - Pavley II: Improve system efficiency and use of low GWP refrigerant alternatives (2010)
  - Reduce leakage via system improvements and OBD (2012)
- **For in-use vehicles:**
  - Do-it-yourself use of small cans (today's regulation)
  - Refrigerant leak test and professional servicing (2011)
- **For vehicles at end of life:**
  - Requirement for refrigerant recovery and recycling (2009)

Proposed Regulation

Reduce emissions from do-it-yourself use of small containers of automotive refrigerant

Regulatory Background

- **Identified in the Early Action Report (Oct, 2007)**
  - Discrete Early Action (Enforceable January 1, 2010)
  - Early Action Report proposed a “can ban”
- **Board directed staff to consider other options**
  - Concern for high cost and impact associated with a “can ban” (estimated cost-effectiveness of $159 per $MTCO_2E$)
  - Industry presented alternate proposal
  - Staff evaluated broad spectrum of options

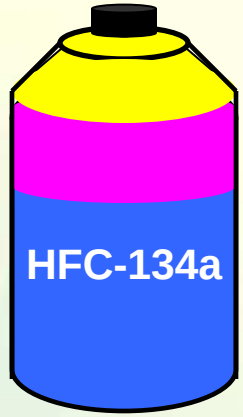
Small Containers of Automotive Refrigerant in California

- **Annual sales for 2006 in California**
  - 2 million cans of HFC-134a sold
  - Equivalent to 0.85 $MMTCO_2E$/year
  - Price of a typical 12-ounce can is ~$10
- **Estimate of small-can use**
  - 95% to consumers (equivalent to 0.81 $MMTCO_2E$)
  - 5% to professional shops (equivalent to 0.04 $MMTCO_2E$)

Do-It-Yourself Servicing Emissions Breakdown

Total Do-It-Yourself emissions (0.81 MMTCO$_2$E/yr)
(HFC-134a sold in small cans to do-it-yourself)

- **Immediate emissions**
  - 11% Servicing Losses
  - 22% Can Heel
- **Delayed emissions**
  - 67% charged to vehicle
  - Refrigerant leaks out unless system is repaired



Three Components of Proposed Regulation

Self-sealing Valve and Improved Labeling

Education Program

Deposit/Return/ Recycling Program

- Implement through certification process
- Generally affects containers with less than 2 lbs

1. Self-sealing Valve and Improved Labeling

- New self-sealing valve on all containers
- Better labels and instructions

Self-Sealing Valve

Improved Label & Instructions

2. Education Program

- **Administered by manufacturers and packagers**
- **Monitored and approved by ARB**
- **At a minimum, develop educational brochures for distribution to consumers (through retailers) and maintain an informative website**
  - Instructions to identify and repair system leaks
  - Best practice techniques for recharging MVAC systems
  - Environmental hazards associated with the refrigerant
  - Risks of overcharging or undercharging
  - Recycling program
- **Enhance education/outreach (unclaimed deposits)**

3. A Recycling Program of Shared Responsibility

Manufacturer

- Fills & packages can
- Recycles used can

Retailer

- Sells can/collects deposit
- Returns deposit
- Collects/returns used cans to manufacturer

Do-It-Yourselfer

- Pays deposit/uses product
- Returns can/collects deposit

- **Initial deposit = $10**
- **Deposit adjusts based on return rate**

Environmental & Economic Impacts

- Emission reduction = 0.26 $MMTCO_2E$ per year
- Cost-effectiveness = $11 per metric ton CO_2 equivalent
- New cost to consumer
  - $1 per can
  - Plus $10 deposit (which is refundable)
- Exportable to other states
- Can be harmonized with a high GWP mitigation fee in the future

Regulatory Development Process

- **2 public workshops**
- **3 workgroup meetings**
- **Outreach**
  - Government agencies
  - Industry
  - Retail
  - Do-it-yourself consumer
- **Comments**

Conclusion & Recommendation

- **Reduces mobile GHG emissions**
- **Attainable with existing technology**
- **Cost-effective**
- **Meets all legal requirements of AB 32**
- **STAFF RECOMMENDS BOARD ADOPTION**