GHG From Transportation

Southern California Clean Vehicle Technology Expo

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Air Resources Board
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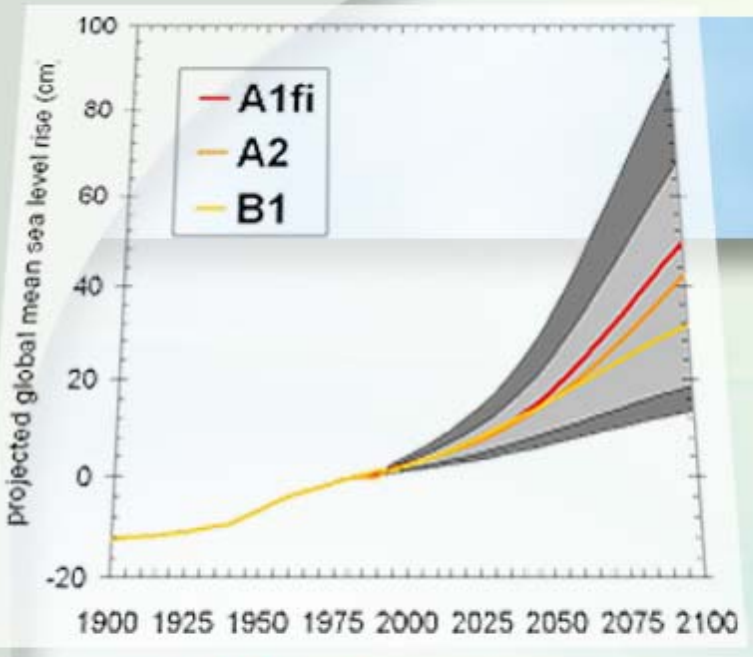
Ontario, CA

Climate Impacts



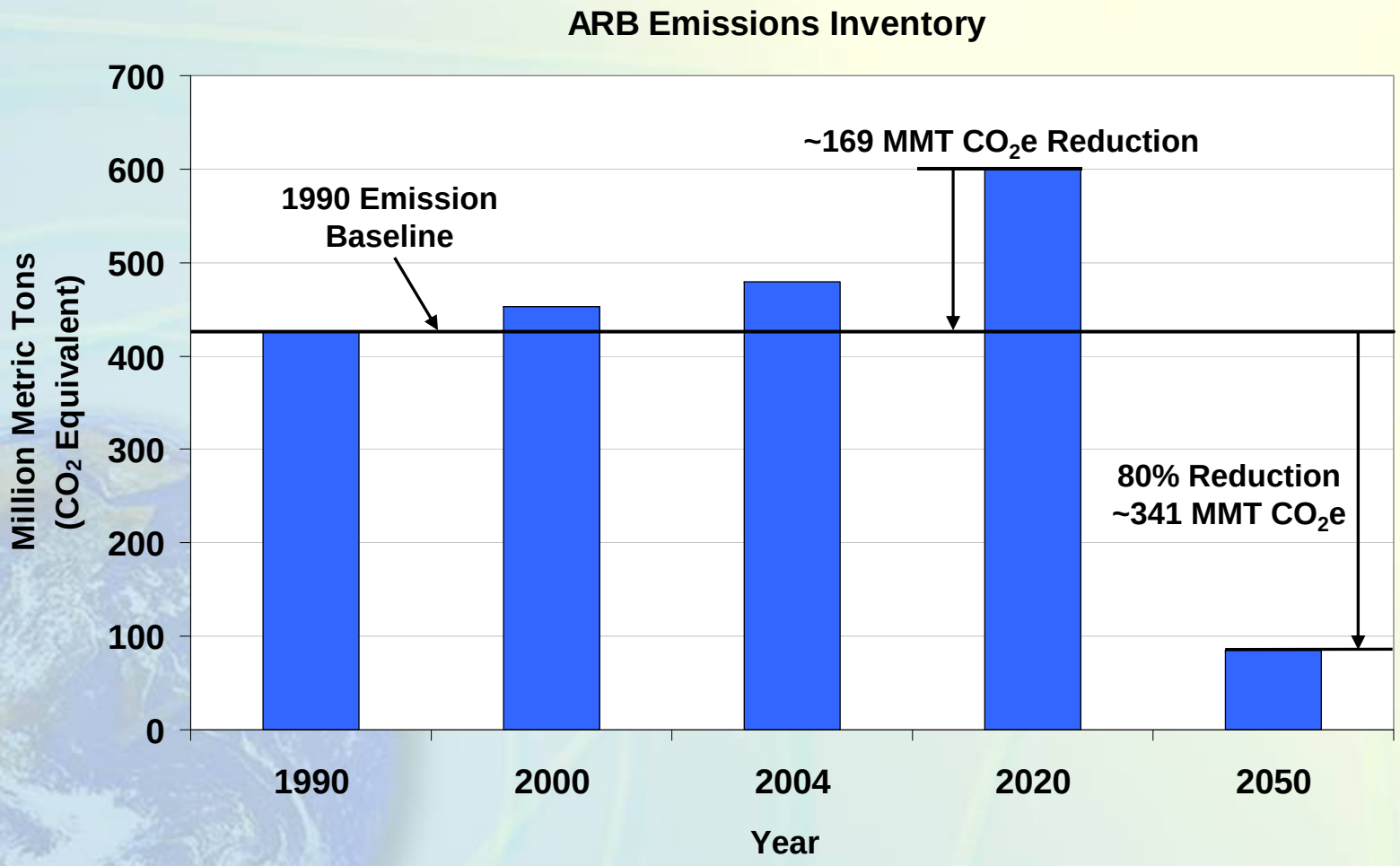
California Projected Impacts

- 75% loss in snow pack
- 1-2 foot sea level rise
- 70 more extreme heat days/year
- 80% more ‘likely ozone’ days
- 55% more large forest fires
- Twice the drought years

The Time for Action Is Now

- Climate change is one of the most serious environmental issues facing the world
- Governor and Legislature have set bold goals for California
- Must meet 1990 GHG levels by 2020
  - Long-term goal: 80% below 1990 levels by 2050
- AB 32 requires ARB to develop a comprehensive plan addressing all significant sources of greenhouse gas emissions

Magnitude of the Challenge



Draft Scoping Plan: Preliminary Recommendation

- Key elements:
  - State Government
  - Transportation
  - Energy
  - Industrial sources
  - High “global warming potential” GHG measures
  - Recycling and waste reduction
  - Agriculture and forests
  - Water efficiency
  - Local Government Actions
  - Regional Transportation-Related GHG Targets

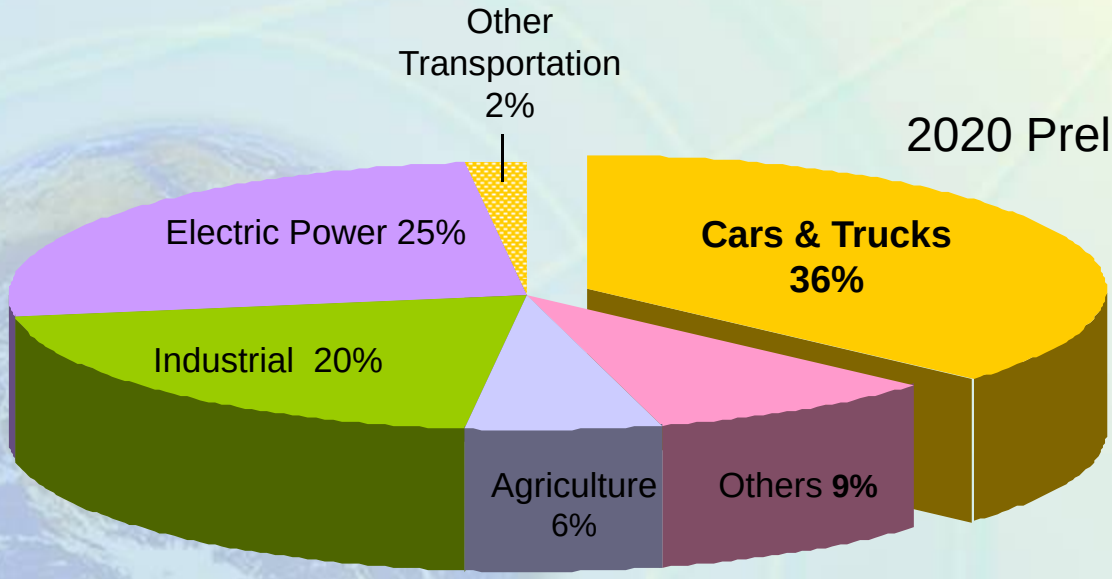
Transportation GHG Emissions

<u>Passenger cars and heavy-duty trucks:</u>

1990 Baseline Emissions:
138 MMTCO2E

2004 Baseline Emissions:
172 MMTCO2E

2020 Preliminary Forecasted Emissions:
216 MMTCO2E



*ARB GHG Inventory, 2004 Baseline Data; Other transportation: trains, planes, ships

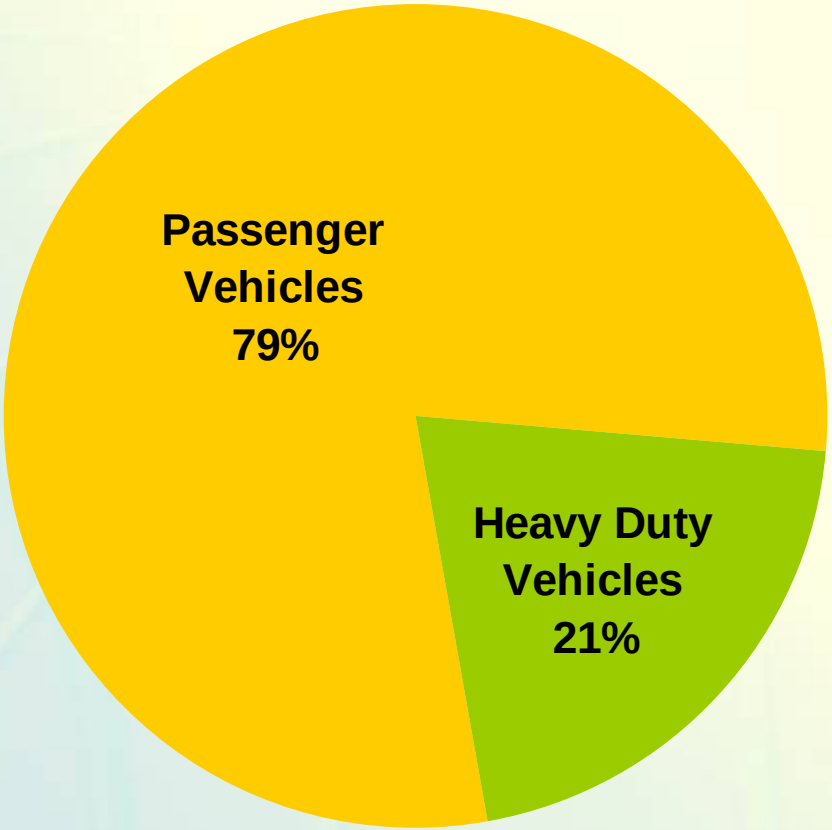
Passenger Vehicles vs. Heavy-Duty

Passenger Vehicles

136 MMTCO2E

Heavy Duty Vehicles

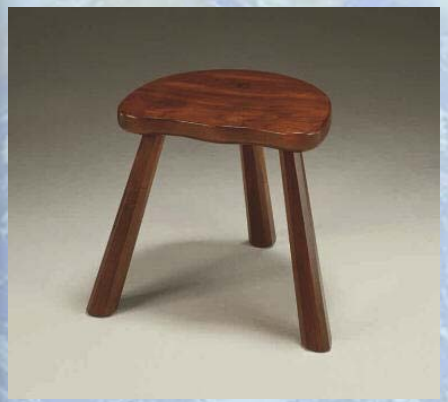
36 MMTCO2E



ARB GHG Inventory, 2004 Baseline Data

Transportation GHG

		Vehicle Technology		Fuels		Vehicle Use
Transp. GHG	=	$\left(\frac{\text{GHG}}{\text{Mile}} \right.$	,	$\frac{\text{GHG}}{\text{Gallon}}$	,	$\text{VMT} \left. \right)$
		⇧		⇧		⇧
		AB 1493 Regulation		Low-Carbon Fuel Standard		Transp. & Land Use Strategies



Vehicles
Transportation

- Light-duty Vehicle GHG reductions
  - Calif. Clean Car Regulations (Pavley I & II)
    - 18% reduction by 2020, -28% by 2030
  - Vehicle efficiency
    - tire efficiency standards, low-friction oil, a/c use
- Medium & Heavy-duty Vehicle GHG reductions:
  - Aerodynamic efficiency (discrete early action measure)
  - Vehicle hybridization
  - Engine efficiency, advanced combustion strategies

Fuel
Transportation

- Low Carbon Fuel Standard
  - Reduce carbon intensity of transportation fuel by at least 10 percent
  - Considering full fuel cycle impacts
  - Anticipated Board consideration in late 2008 or early 2009

Vehicle Use
Transportation

- Land use and transportation strategies
  - SB 375 and Regional Transportation-Related Greenhouse Gas Targets
- High Speed Rail
  - Support implementation of plans to construct and operate a rail system between Northern and Southern CA
  - Dependant on voter approval

Goods Movement
Transportation

- Goods Movement – Prop. 1B funds
  - Drayage trucks, port electrification
  - System efficiency, vessel speed reductions, limits on duration/use of refrigeration units, etc.

GHG Emissions Inventory

- Assist Local Govt in Developing Local Climate Action Plans
- Local Government Operations Protocol
  - Government buildings, fleet vehicles, water treatment facilities, landfill and composting facilities, and others

Vehicle Fleet GHG Emissions

Total Fleet GHG Emissions =

Mobile combustion CO2 emissions +

Mobile combustion methane (CH4) and nitrous oxide (N2O) emissions +

Fugitive emissions from mobile air conditioning

Mobile Combustion CO2 Emissions

CO2 Emissions (metric tons) =

Fuel Consumed (gallons) ×
Emission Factor (kg CO2/gallon) ÷
1,000 (kg/metric ton)

Mobile Combustion CH4 & N20 Emissions

CH4 Emissions
(metric tons) =

Annual Distance (miles) ×
Emission Factor (g CH4/mile) ÷
1,000,000 (g/metric ton)

CH4 Emissions (metric tons CO2e) =
CH4 Emissions (metric tons) ×
21 (GWP)

N2OEmissions
(metric tons)=

Annual Distance (miles) ×
Emission Factor (g N2O/mile) ÷
1,000,000 (g/metric ton)

N2O Emissions (metric tons CO2e) =
N2O Emissions (metric tons) ×
310 (GWP)

Fugitive Emissions from Air Conditioning

HFC Emissions (metric tons CO_2e) =

HFC Emissions (metric tons) × GWP (specific to type of HFC)

All Emissions are "Local"

- Meeting AB 32 goals means emissions in every community being reduced an average of 15% from today's levels by 2020.
  - State, regional, local, and individual effort
  - Energy, waste, water, transportation
  - Local Climate Action Plans
    - Keep track of emissions
    - Take actions to reduce emissions

Working Together to Reduce GHG Emissions

	State	Regional/Local	Individual
Transportation	• Vehicle technology regulations • Low-carbon fuel standard • Set regional targets	• Blueprint planning efforts • Local land use and transportation decisions • Clean fleets	• Reducing 1 vehicle round trip per week would reduce trip-making by 5%
Energy	• Building & appliance standards • 33% renewables portfolio • Million solar roofs program	• Influence carbon content of municipal utility operation • Local building energy savings	• Purchasing and conservation decisions
Waste	• Landfill methane control • Waste Management Board recycling efforts	• Collection system adjustments • Waste reduction programs	• Reducing, reusing, recycling
Water	• Develop statewide plan to reduce per capita water use 20%	• Reduce municipal operation use • Community-wide conservation programs	• Save water in the home and in the yard

For More Information

- Local Government Protocol

  http://www.arb.ca.gov/cc/protocols/localgov/pubs/final_lgo_protocol_2008-09-25.pdf

- ARB Climate Change Web Site

  (To stay informed - sign up for list serve)

  www.arb.ca.gov/cc/cc.htm

- California Climate Change Portal

  www.climatechange.ca.gov