



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

# **Update on the Implementation of AB 32 Including the Cap-and-Trade Regulation**

**Plasma Applications Group Meeting**

**Greenhouse Gas Emissions Management  
and Climate Protection**

**May 14, 2012**

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# AB 32 Background

- Global Warming Solutions Act of 2006
  - Implemented by the California Air Resources Board (CARB)
- Reduce State's GHG emissions to 1990 levels by 2020
  - 1990 State GHG emissions established by CARB as 427 million metric tons (MMT) carbon dioxide equivalents (CO<sub>2</sub>e)
- Estimated State GHG emissions in 2020 without AB 32
  - 596 MMT CO<sub>2</sub>e (CARB 2008 Scoping Plan estimate)
    - 169 MMT reduction needed (28% reduction)
  - 545 MMT CO<sub>2</sub>e (CARB 2010 revised estimate)
    - 118 MMT reduction needed (22% reduction)
    - Considers economic downturn



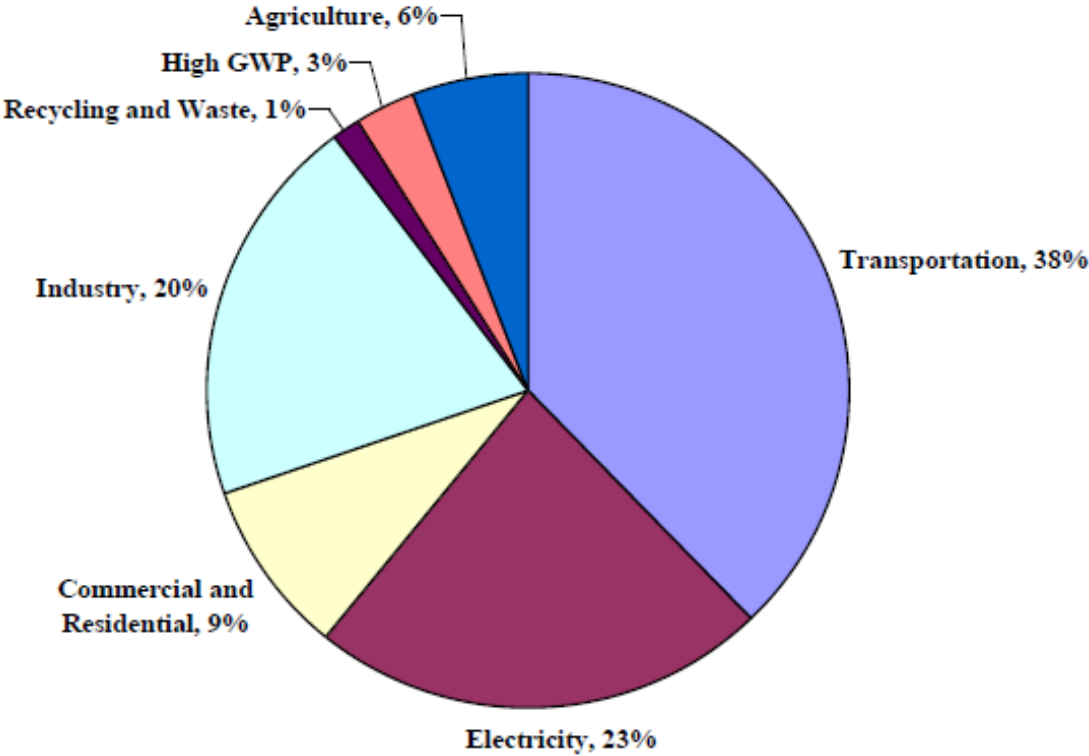
# GHGs Covered by AB 32

- Global Warming Potentials (GWPs) Used in Cap and Trade Regulation are from 40 CFR Part 98, Subpart A

GHG	GWP
Carbon Dioxide, CO <sub>2</sub>	1
Methane, CH <sub>4</sub>	21
Nitrous Oxide, N <sub>2</sub> O	310
Sulfur Hexafluoride, SF <sub>6</sub>	23,900
Hydrofluorocarbons, HFCs	12 – 11,700
Perfluorocarbons, PFCs	6,500 – 17,340
Other fluorinated GHGs	11 – 17,200



# California's GHG Emissions



Source: Climate Change Scoping Plan, CARB, Dec. 2008.  
Chart represents average 2002 – 2004 emissions



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# AB 32 Scoping Plan

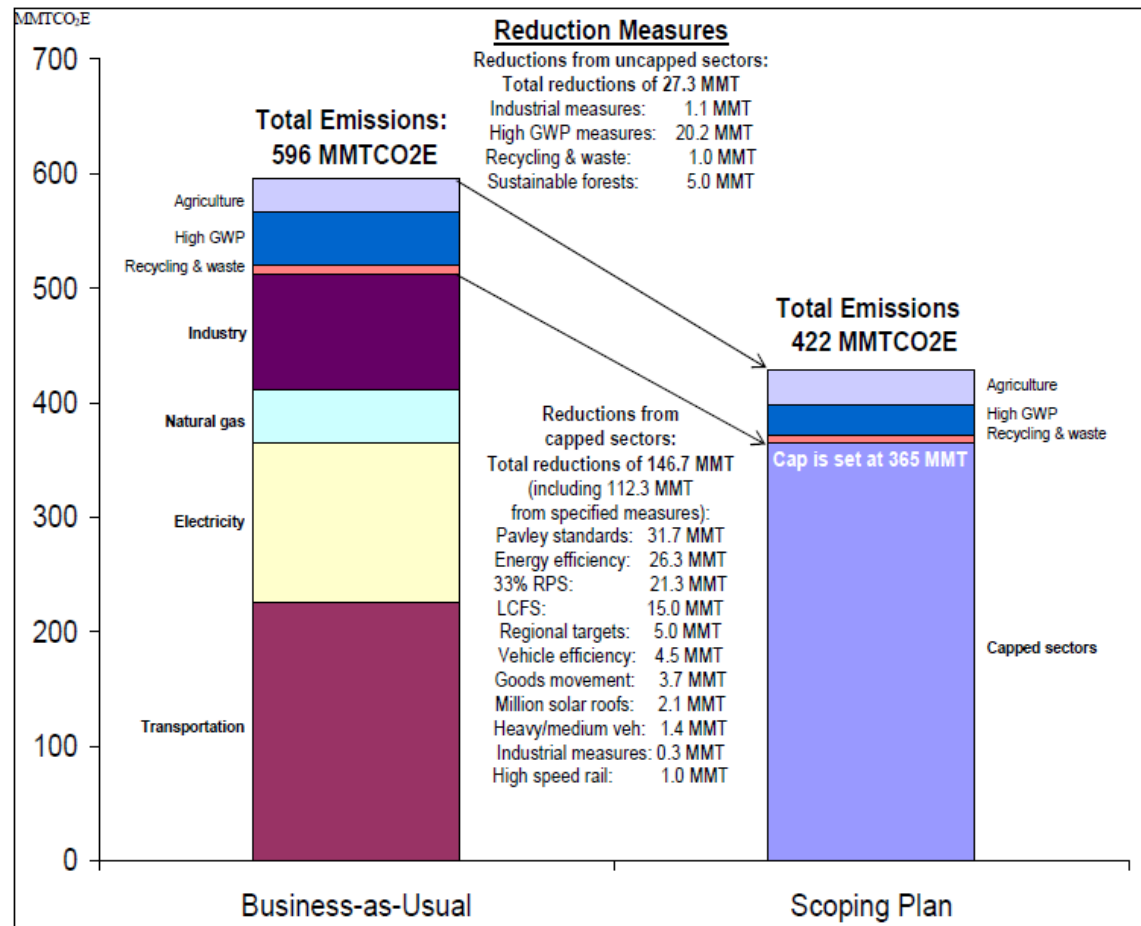
- Scoping Plan approved by CARB on Dec. 12, 2008
  - 69 GHG control measures
- Scoping Plan measures with > 10 MMT CO<sub>2</sub>e reductions

Measure	GHG reductions (MMT/yr CO <sub>2</sub> e)
<b>Pavley and Advanced Clean Cars regulations (new light-duty vehicles)</b>	30
<b>Renewable electricity standards (increase from 12% to 33% renewables by 2020)</b>	23
<b>Cap-and-trade regulation</b>	18 – 27
<b>Energy efficiency measures</b>	17
<b>Low carbon fuel standard</b>	15

GHG reductions are July 2011 CARB estimates



# California GHG Emissions in 2020 and AB 32 Scoping Plan Control Measures



Source: Climate Change Scoping Plan, CARB, Dec. 2008.



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# Discrete Early Action Measures

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- Nine measures adopted by Jan. 1, 2010
  - Low Carbon Fuel Standard
  - Landfill methane capture
  - Automobile air conditioning -- non-professional
  - Sulfur hexafluoride – non-electric
  - High GWP consumer products
  - Tractor trailer efficiency measure
  - Tire pressure program
  - Port shore power
  - Semiconductor operations



# Semiconductor Operations Rule

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- Air districts identified in regulation as implementing agency
- Regulates fluorinated gases used in chemical vapor deposition and etching operations
- Reporting
  - Annual reports due beginning Mar. 1, 2011
- Emission standards
  - Tiered standards based on annual production levels
    - 0.2, 0.3, or 0.5 kilogram CO<sub>2</sub>e emitted per cm<sup>2</sup> wafer produced
  - Process optimization, alternative chemistries, and/or abatement
- Compliance with standards required by Jan. 1, 2012 (2 years later if upgrading equipment to produce 200 mm or larger wafers)
- 14 Bay Area facilities are subject to emission standards
- 24 additional Bay Area facilities are subject to emissions reporting only





# Sustainable Communities Strategy: SB 375

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- Sustainable Communities and Climate Protection Act of 2008
- Estimated GHG Reductions:
  - 3 MMT CO<sub>2</sub>e by 2020
  - 15 MMT CO<sub>2</sub>e by 2035
- CARB sets GHG reduction goals for the 18 California Metropolitan Planning Organizations (MPOs)
  - Per capita GHG reduction from passenger vehicles
  - Bay Area goals set at 7% for 2020, and 15% by 2035
- MPOs must include a Sustainable Communities Strategy (SCS) in their Regional Transportation Plan (RTP)
  - Land use, housing and transportation planning



# Mandatory Reporting Regulation

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- Requires annual reporting of GHG emissions
- Industrial facilities
  - Applicability threshold for full reporting: 25,000 MT/yr CO<sub>2</sub>e
  - Applicability threshold for abbreviated reporting: 10,000 MT/yr CO<sub>2</sub>e
  - Certain source categories must report regardless of emissions
- Suppliers of transportation fuels, natural gas, natural gas liquids, and carbon dioxide
  - Applicability threshold: 10,000 MT/yr CO<sub>2</sub>e
- Electricity retail providers and marketers
  - All imported and exported electricity
- Verification program
  - CARB accreditation of verification bodies



# Cap-and-Trade Regulation

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➤ Dec. 17, 2010

- Cap-and-trade regulation approved by CARB Board with a series of modifications to be made prior to Oct. 28, 2011

➤ Oct. 20, 2011

- CARB Board adopted final cap-and-trade regulation
- Certified CEQA-document with finding of overriding considerations and Adaptive Management Plan
- Delayed first year for which emission allowances are due from 2012 to 2013



# Cap-and-Trade Regulation (cont.)

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- Market-based measure provides flexibility in reducing emissions
  - Affected facilities are not subject to specific emission limits, but must turn in “compliance instruments” equal to their actual emissions
  - Compliance instruments = Allowances and offsets
- Scope
  - Starts in 2013 for large industrial facilities and electricity providers (including power importers) with emissions greater than 25,000 MMT per year CO<sub>2</sub>e
  - Starts in 2015 for distributors of transportation fuels, natural gas and other fuels



# Cap-and-Trade Regulation (cont.)

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## ➤ The Cap

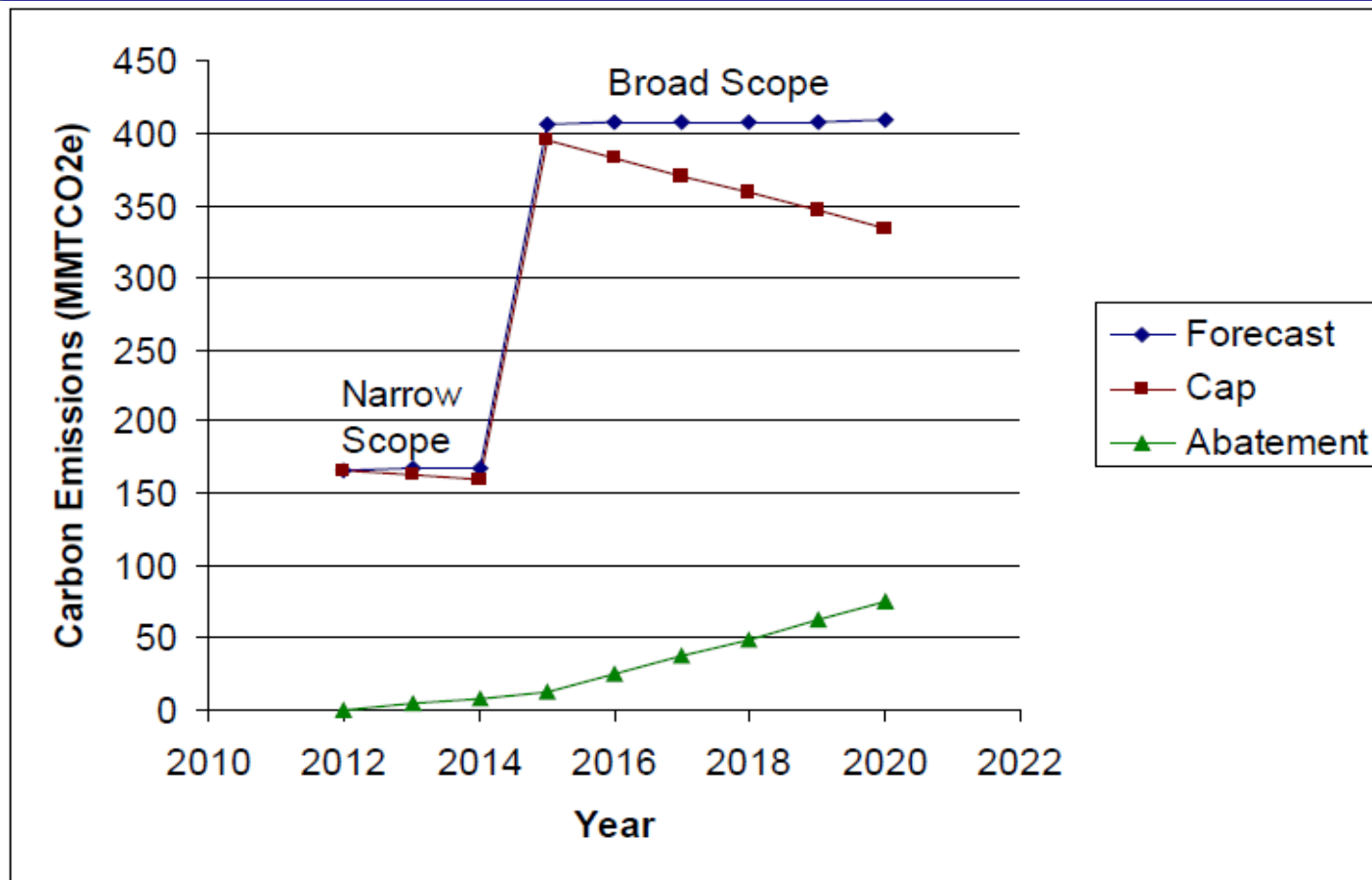
- Initial cap set at emissions forecast for 2012
- Cap reduced by 2% per year in 2013 and 2014
- Cap reduced by 3% per year from 2015 to 2020

## ➤ Allowances

- Represent a “permit” to emit 1 metric ton of CO<sub>2</sub>e
- Issued by CARB each year in an amount equal to the cap
- Mainly free at program start
  - Free allowances based on efficiency benchmark for each industry
  - More free allowances for industries with high risk of “leakage”
- Increasing auction percentage over time
- No allowances need to be turned in for biomass-based CO<sub>2</sub>



# Baseline Emissions, Cap Level, and Abatement Required to Achieve the Cap



Source: Proposed Regulation to Implement the California Cap-and-Trade Program, Staff Report, CARB, Oct. 28, 2010



# Cap-and-Trade Regulation (cont.)

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## ➤ Offsets

- GHG emission reduction credits from sources outside of the cap
- Limited to emission reduction projects in U.S.
- May be used for up to 8 percent of a facility's compliance obligations
- Must be independently verified based on CARB-approved protocols
- Approved offset protocols
  - Livestock methane capture and control
  - Destruction of Ozone Depleting Substances
  - U.S. forest projects
  - Urban forest projects



# Costs of GHG Allowances / Offsets

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- CARB estimates that GHG allowances will likely sell for approximately \$20 per MT CO<sub>2</sub>e
  - Worst-case cost estimates are \$100 per MT CO<sub>2</sub>e
- Cost Containment Measures
  - 3-year compliance periods
  - Banking of allowances
  - Offsets
  - Allowance Price Containment Reserve
  - Potential linkage to other GHG trading systems





# Recent Activity on Cap-and-Trade

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- Jan. 31, 2012: Registration deadline for covered entities
- Feb. 3, 2012: CARB workshop to discuss draft amendments to link California and Quebec cap-and-trade programs
- Auction of allowances
  - Auction system to be launched and tested over next several months, with simulated “practice” auction to be held in August
  - First auction of allowances scheduled for Nov. 14, 2012
  - Quarterly auctions thereafter
- First allowances due to be turned in by Nov. 2014 based on 2013 actual GHG emissions

