



Workshop Agenda

- **Greenhouse Gas Inventory and 1990 Emissions Level**
 - Overview
 - Sector Technical Discussion

- **Mandatory Reporting**
 - Overview
 - Sector Technical Discussion



1990 GHG Emission Inventory and 2020 Limit

3

Overview

- Statutory Requirements
- 1990 Emissions Inventory
- 1990 Level and 2020 Limit
- Proposed Schedule
- Sector Review
- Next Steps

4

ARB Inventory Responsibility

- Update statewide GHG inventory
- Board adoption
- CEC 1990-2004 inventory transferred January 1, 2007

5

1990 Emissions Level and 2020 Limit

- Determine 1990 GHG emissions level
- Establish 2020 GHG emissions limit equivalent to 1990 GHG emissions level
- Use best available information
- Present to Board by January 1, 2008

6

Role for Statewide GHG Inventory

- 1990 emissions level basis for 2020 limit
- Starting point for scoping plan

7

Inventory Review and Evaluation Process

- Update California Energy Commission 1990-2004 inventory
- Document methodology

8

Focus of Inventory Review

- Refineries
- Transportation
- Electric Power
- Landfills
- Cement
- Agriculture/Ag Soil Management
- Forest and Rangeland

*~80% of
Total
1990
Emissions*

9

Status of GHG Inventory Review

- Review is complete
- Mostly rely on current methodologies
- Incorporate new input data where appropriate

10

Obtaining Improved Data

- State and federal agencies
 - Energy Information Administration (EIA)
 - California Energy Commission
 - U.S. EPA
 - Others
- Focused technical discussions with stakeholders

11

1990 Emissions Level

- Reflect statewide, aggregated, annual emissions
- Not sector or facility specific
- Consider emissions of six “Kyoto gases”
- Express in tons of CO₂ equivalents (CO₂e)

12

2020 Emissions Limit

- Equivalent to 1990 level
- Statewide, aggregate emissions
- Remains in effect unless otherwise amended or repealed
- Present to Board for consideration by January 1, 2008

13

Proposed Schedule

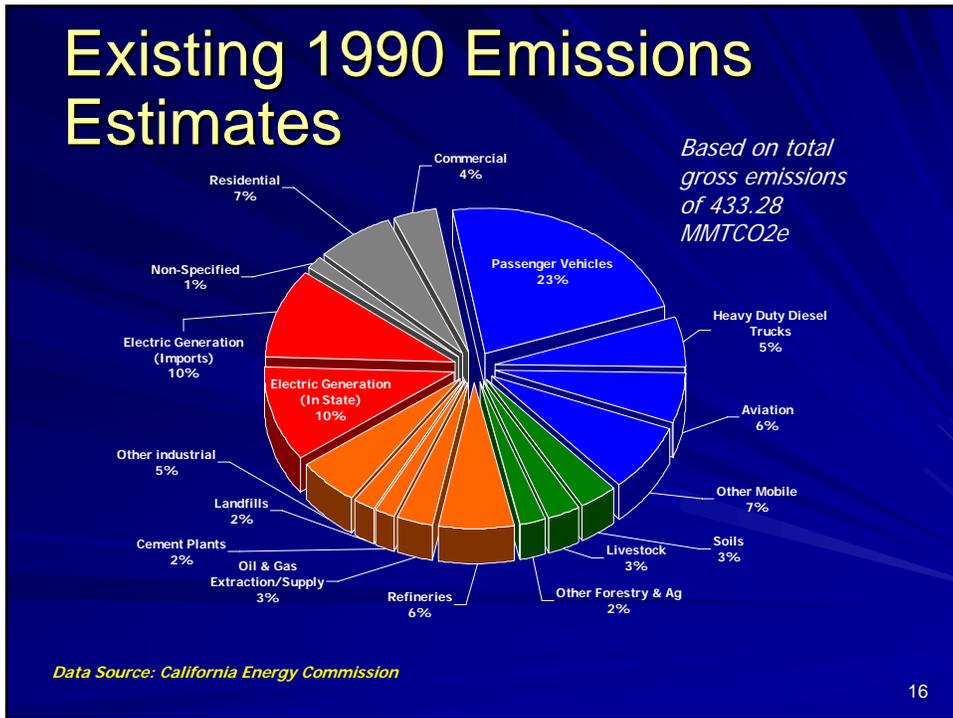
- June 2007
 - Release documentation and updates
- July 2007
 - Public Workshop
- Early Fall 2007
 - Draft staff report
- November/ December 2007
 - Board consideration of GHG inventory and 1990 level / 2020 limit in public hearing

14



1990 GHG Emission Inventory: Technical Details

15



Sector Contribution to 1990 Inventory

Sector	% of 1990 Inventory
Refineries	6.4%
Transportation	41.0%
Electric Power	20.6%
Landfills	1.9%
Cement	1.7%
Agriculture	2.8%
Ag Soil Management	3.4%
Forest and Rangeland	1.2%
Total	~80%

Data Source: California Energy Commission

17

Refineries

- Existing 1990 Estimate: 27.85 MMTCO₂e
- Based on top-down data from EIA
- Improved facility-specific data, if possible
- On-going focused technical discussions

18

Transportation

- Existing 1990 Estimate: 177.84 MMTCO₂e
- CO₂ estimates from fuel use data
- CH₄ estimates from models (EMFAC)

19

Electric Power

- Existing 1990 Estimate: 89.22 MMTCO₂e
- Power plant specific data from EIA and CEC
- Use CEC approach for unspecified imports
- Use 3 percent line loss assumption

20

Landfills

- Existing 1990 Estimate: 8.13 MMTCO_{2e}
- Survey underway to improve emissions estimate
- Final estimate may require use of model with waste-in-place data
- On-going discussions with CIWMB, landfill owner/operators, and other stakeholders

21

Cement

- Existing 1990 Estimate: 7.30 MMTCO_{2e}
- Based on statewide production data from USGS
- Improved data anticipated (fuel use, etc.)

22

Agriculture / Ag Soil Management

- Existing 1990 Estimate: 26.93 MMTCO₂e
 - Agriculture: 12.25 MMTCO₂e (includes enteric fermentation, manure mgt, rice field flooding, and ag residue burning)
 - Ag Soil Management: 14.68 MMTCO₂e
- Improvements based primarily on calculation corrections

23

Forest and Rangeland

- Existing 1990 Estimate: 5.15 MMTCO₂e
- Existing data based on California Energy Commission and CDF reports
- No change anticipated from 1990 baseline
- Future forecasts to be reviewed for scoping plan

24

Public Process

- Kick-off workshop in December 2006
- Focused technical discussions to identify improvements
 - Data
 - Emission factors
 - Calculation methods

25

Next Steps

- Release documentation of existing inventory by sector and draft updates
- Determine 1990 emissions level
- Hold public workshop for feedback

26

Comments or Questions?



27

ARB Contacts

Richard Bode – Chief
Emissions Inventory Branch
rbode@arb.ca.gov
(916) 323-8413

Doug Thompson – Manager
Climate Change Reporting Section
dthompson@arb.ca.gov
(916) 322-7062

Webster Tasat – Manager
Emission Inventory Analysis Section
wtasat@arb.ca.gov
(916) 323-4950

Robert Jenne – Legal Counsel
rjenne@arb.ca.gov
(916) 322-3762

GHG Mandatory Reporting Website
<http://www.arb.ca.gov/cc/ccei/ccei.htm>





Mandatory Reporting: Proposed General Concepts

29

AB 32 Statutory Requirements for Reporting



- Reporting regulation by January 1, 2008
- Begin with sources contributing the most to statewide emissions
- Account for all electricity consumed, including imports
- Provide reporting tools

30

Goals of Reporting

- Improve GHG inventory
- Track trends
- Support emission reduction strategies
- Consistency

31

Reporting: General Requirements

- Annual reporting at facility level
- Report based on operational control
- Specified facility sources and gases
- Energy use



32

Initial Reporting Facilities (proposed)

- Power plants (390) & utilities (50)
- Oil refineries (25)
- Cement plants (11)
- Large stationary combustion sources (140)

94% of
point
source
CO₂
emissions



Defining a Facility

- Contiguous or adjacent properties
- Under common ownership or control
- Emits GHGs
- Considered a single major industrial source grouping



Emission Sources

- Stationary combustion
- Manufacturing processes
- Fugitive emissions
- Mobile combustion if significant
- Energy purchases

35

Energy Purchases

- Amount of electricity, steam, cooling
- Facility reports energy use
- Energy supplier provides emission factor
- ARB computes emissions

36

Verification

- AB 32 requires verification of reported emissions
- Propose third-party approach
- Verifiers to be trained and accredited

37

Other Efforts

- Developing electronic tools to simplify and streamline reporting
- Developing reporting formats similar to existing formats (e.g., CARROT)
- Providing training programs and technical assistance
- Coordinate with multi-state Climate Registry

38

Timing for Reporting



- ARB regulatory hearing: Dec 2007
- Reporting of 2008 GHG emissions begins mid-2009

39

Schedule



- Continue technical discussions by sector
- Draft regulatory text available mid-July
- Next full workshop July/August
- Staff Report & Proposed Regulation in October
- Board Hearing in December

40

Comments?



41



Mandatory Reporting:

Technical Details

42

General Reporting for Stationary Combustion Sources



Introduction

- Applicable to combustion point sources above threshold
- ARB will adapt elements of existing Registry protocol to mandatory reporting regulation
- Registry general reporting protocol (GRP)
 - IPCC, WRI/WBSD GHG protocol
 - DEFRA, US DOE, US EPA

Reporting Threshold for General Stationary Combustion Sources

- Proposed facility threshold:
 - 25,000 metric tons CO₂ per year
- ~140 facilities would report
- Estimate based on 2004 air district permit data
 - Fuel use to estimate CO₂
- Threshold consistent with EU reporting

Stationary Combustion

- Non-mobile sources:
 - Turbines, boilers, internal combustion engines, flares, etc.
- Methodology:
 - Fuel use calculation
 - $$\text{Total annual emissions} = \text{emission factor} * \text{amount of annually consumed fuel}$$
 - ARB will provide emission factors for various fuels

Indirect Energy Use

- Electricity usage from utility bills
- Methodology
 - Determine annual electricity usage purchased and consumed
 - ARB to apply electricity emission factor specific to power provider
 - Total annual emissions = emission factor * annual electricity usage
- Imported steam, heating, cooling

47

Reporting Small Emission Sources at Facilities

- Regulation will explicitly define facility GHG sources to report
- Will include mobile sources if significant
- Will not include fugitive emissions if directly tied to process emissions
 - Examples: Coal for power plants, leaks for refineries

48

Reporting: Facility-wide Basis

- Emissions will be reported on a facility-wide basis
 - Regulation will specify detail required
- Supporting data must be provided to ARB for verification
- Verifiers would review supporting data

49

Emission Calculation Methodologies

- Key calculation requirements will be regulatory
 - Activity data requirements
 - Emission calculation methods and inputs
 - Sources required to be estimated
- Emission factors and supporting information in technical guidance

50

Next Steps

- Seek stakeholder input
 - Emission Factors
 - Calculation methodology
- Technical discussion with stakeholders June 25
- Draft regulatory language

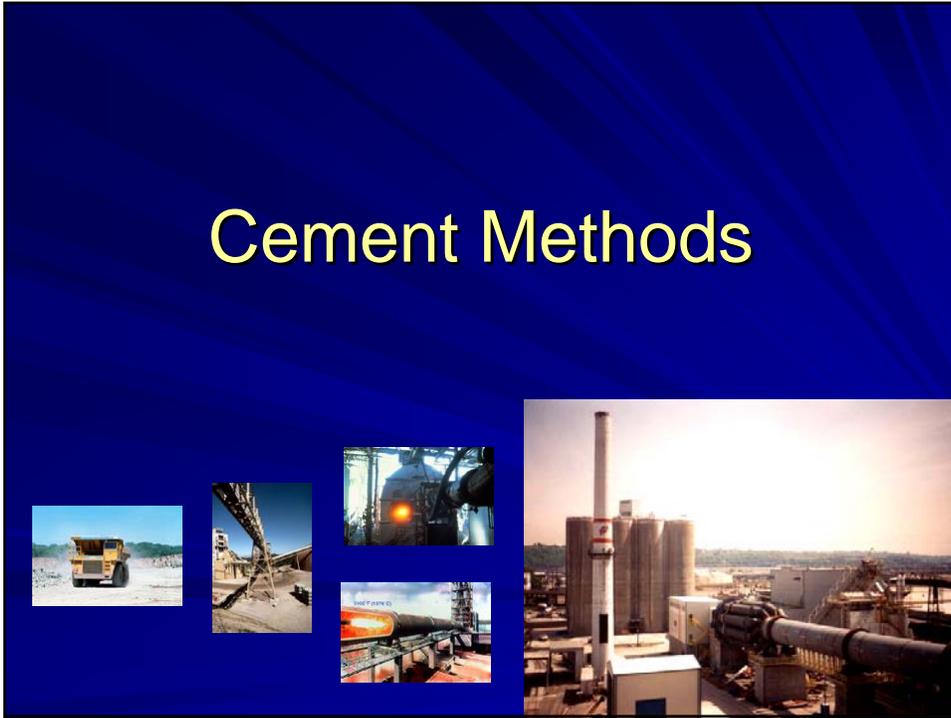
51

Questions or Comments?



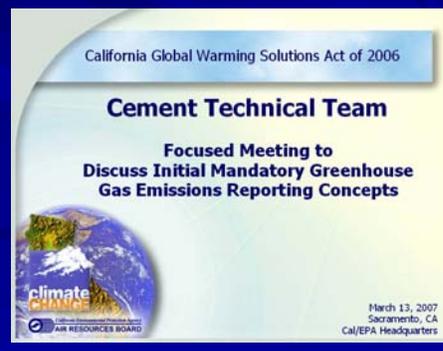
52

Cement Methods



Meetings

- Formed Cement Technical Team
 - Key Stakeholders
- Stakeholder Interviews
- Public Meetings
 - March 13, 2007
 - April 11, 2007
 - May 9, 2007



Emissions Sources

- Process-related emissions
- Stationary combustion
- Fugitive emissions from fuel storage
- Mobile combustion
 - Off-road quarry vehicles, etc.



55

Initial Proposal

- Facility-level reporting for all eleven California cement plants
- Clinker-based method from Registry/WBCSD Protocol
- Use plant-specific emission factors
- Report CO₂, CH₄ and N₂O Emissions



56

Remaining Questions

- Verification
 - Cement industry concerns with third-party approach
 - Other stakeholders request quality assurance/control



57

Next Steps

- Review Comments
- Draft Regulation Language
- Staff Report



58

Power and Utilities Methods



Meetings

- Individual stakeholder groups
- Technical Discussions (40 to 50 participants)
 - April 10, 2007
 - May 8, 2007

Who Would Report

- Generating facilities by power unit ≥ 1 MW
- No reporting to ARB by zero-emission facilities
- Retail service providers

61

Emission Sources

- Power generation emissions
- Process emissions
 - Acid gas scrubbing
- Fugitive emissions
 - Coal storage
 - Geothermal
 - Circuit breakers
- Power purchases, wholesale sales, exports
- Indirect emissions from power purchased and consumed

62

Initial Proposals Discussed

- CO₂ from natural gas facilities \geq 25 MW
- Transmission/distribution losses
- N₂O and CH₄
- Coal storage and acid gas scrubbers
- HFCs from cooling units
- No reporting for domestic cooling/refrigeration or fire suppression
- ARB repository for in-state emissions by power unit

63

Remaining Questions

- Method consistency for some fuels
- Methods for:
 - Co-generation and self-generation
 - Fugitive SF₆ from transmission/distribution
 - Fugitive CO₂ geothermal
- Significance of mobile sources

64

Topics for Coordination with CPUC and CEC

- Unspecified power purchases
- Wholesale sales
- Exports
- Utility level emission factors

65

Next Steps

- Continue discussions with stakeholders
- Technical discussions
- Draft regulatory language
- Comments from stakeholders

66

Refineries Methods



Meetings

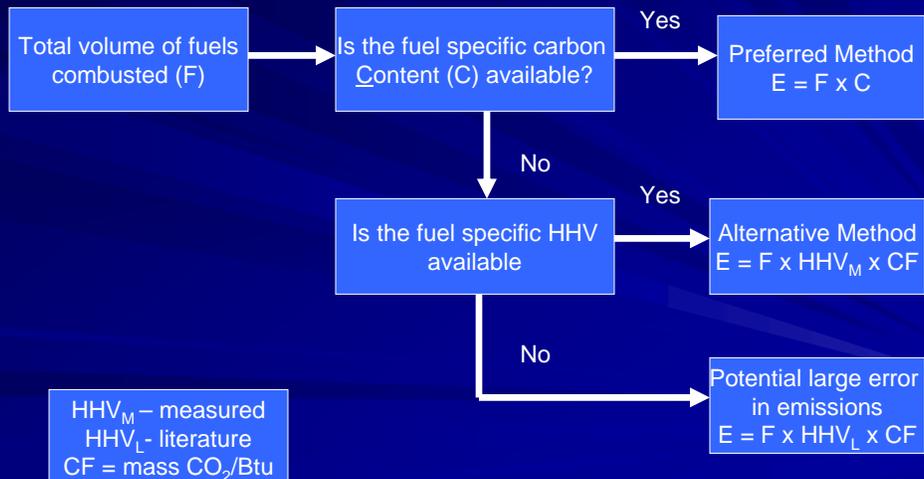
- Individual stakeholder groups
- Technical discussions
 - April 24, 2007
 - May 22, 2007

Emission Sources

- Stationary Combustion
 - Process heaters, steam production, turbines, engines, cogeneration
- Process Emissions
 - Crude processing, catalytic cracking, hydroprocessing, hydrogen production, sulfur recovery
- Fugitive Emissions
 - Product storage tanks, flares, blowdown systems (wastewater treatment, refrigerants)
- Indirect Emissions – purchased energy

69

Stationary Source CO₂ Emissions Refinery Fuel



70

Process Emissions

- Catalytic Crackers
 - Coke Burn Rate method (40CFR63.1564)
 - Air Rate and flue gas CO/CO₂ based method

- Hydrogen Production
 - Feedstock Rate method
 - Hydrogen production rate method

71

Fugitive Emissions Under Evaluation

- Model for process and storage tank CH₄ emissions
- Leak detection and repair data?
- Cryogenic HFC emissions
- Wastewater Treatment
- Flares

72

Next Steps

- Continue Review of Methods
 - API Compendium, other sources
- Upcoming Technical Discussions
 - June 19 and July 6
- Coordinate with CCAR
 - Concurrent Protocol Development
- Draft regulatory language

73

Comments and Feedback?



74

Verification: Initial Concepts



Why Verification?



- AB 32 requires it
- Expected under international standards
- Experience with voluntary reporting shows the need
- Complexity of emissions estimation

Verification: Initial Proposal

- Require annual verification for most complex sources
- Require verification once within first three years for other sources
- Require annual verification for anyone entering a future market

77

Third Party Verification

- Most consistent with existing standards, including ISO
 - Already required for CCAR members
- Verifiers would be trained under ARB-approved curriculum
 - Existing CCAR-accredited verifiers
 - Air District staff
 - Others added as needed

78

Verification Activities

- Identify sources and review data management systems
- Focus on most significant and uncertain sources
- Differences exceeding 5 percent considered significant
- Detailed verification report to facility and ARB

79

Verification Oversight

- ARB staff responsible for enforcing regulation
- Verification process will assist efforts to enforce compliance
- Targeted review of submitted data and verifiers

80

Regulation to Specify:

- Core GHG data verification requirements
- Accreditation requirements for verifiers
- ARB oversight
- Conflict-of-interest

81

Conflict of Interest

- Term Limit
 - Verifiers to be changed after 3 years of conducting verification activities
 - Allowed to resume with client after 1 year off cycle for verification
- Conflict of Interest Policy
 - Must agree not to act on behalf of reporting facility as both consultant and verifier concurrently or within any 3 year period

82

Next Steps

- Meet with interested stakeholders
- Consider by sector in technical discussions
- Draft regulatory language

83

Comments and Ideas?

- Comments by phone, email, writing are also encouraged
- Comments by June 30 would be most helpful
- There will be additional opportunities for feedback



84

Overall Next Steps and Schedule

- Continue technical discussions as needed
- Draft regulatory text available mid-July
- Next full workshop July/August
- Staff Report & Proposed Regulation in October
- Board Hearing in December



85

ARB Contacts

Richard Bode – Chief
Emissions Inventory Branch
rbode@arb.ca.gov
(916) 323-8413

Doug Thompson – Manager
Climate Change Reporting Section
dthompson@arb.ca.gov
(916) 322-7062

Webster Tasat – Manager
Emission Inventory Analysis Section
wtasat@arb.ca.gov
(916) 323-4950

Robert Jenne – Legal Counsel
rjenne@arb.ca.gov
(916) 322-3762

GHG Mandatory Reporting Website
<http://www.arb.ca.gov/cc/ccei/ccei.htm>



Staff Contacts

Reporting Regulation, Patrick Gaffney
pgaffney@arb.ca.gov (916) 322-7303

General Reporting Protocol, Rajinder Sahota
rsahota@arb.ca.gov (916) 323-8503

Verification, Rajinder Sahota
rsahota@arb.ca.gov (916) 323-8503

Power/Utilities, Pamela Burmich
pburmich@arb.ca.gov (916) 323-8475

Cement, Dana Papke
dpapke@arb.ca.gov (916) 323-2308

Forestry, Jeanne Panek
jpanek@arb.ca.gov (916) 322-1029

Oil and Gas, Byard Mosher
bmosher@arb.ca.gov (916) 323-1185

