

GHG Risks, Reporting and Stakeholder Expectations



Presented to:

The Auditing Roundtable

Presented by:

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Today's Agenda

Review of AB 32

- Mandatory Reporting
- Verification Costs
- Command-and-Control Rules
- Cap-and-Trade

Review of EPA Rule

- Major Provisions
- Differences with AB 32

Wrap-up & Questions



Welcome and Introduction

Speaker – Christina Schwerdtfeger:

- President of Coto Consulting, Inc. – a woman-owned small business
- 22 years experience as an environmental consultant
- Accredited as a GHG lead verifier with the State of California
- Instructor in UC Irvine's Sustainability Leadership Program
- Published author and speaker. See website for examples: www.coto-consulting.com



AB 32 Overview

Assembly Bill 32 (AB 32) is California's Global Warming Solutions Act of 2006:

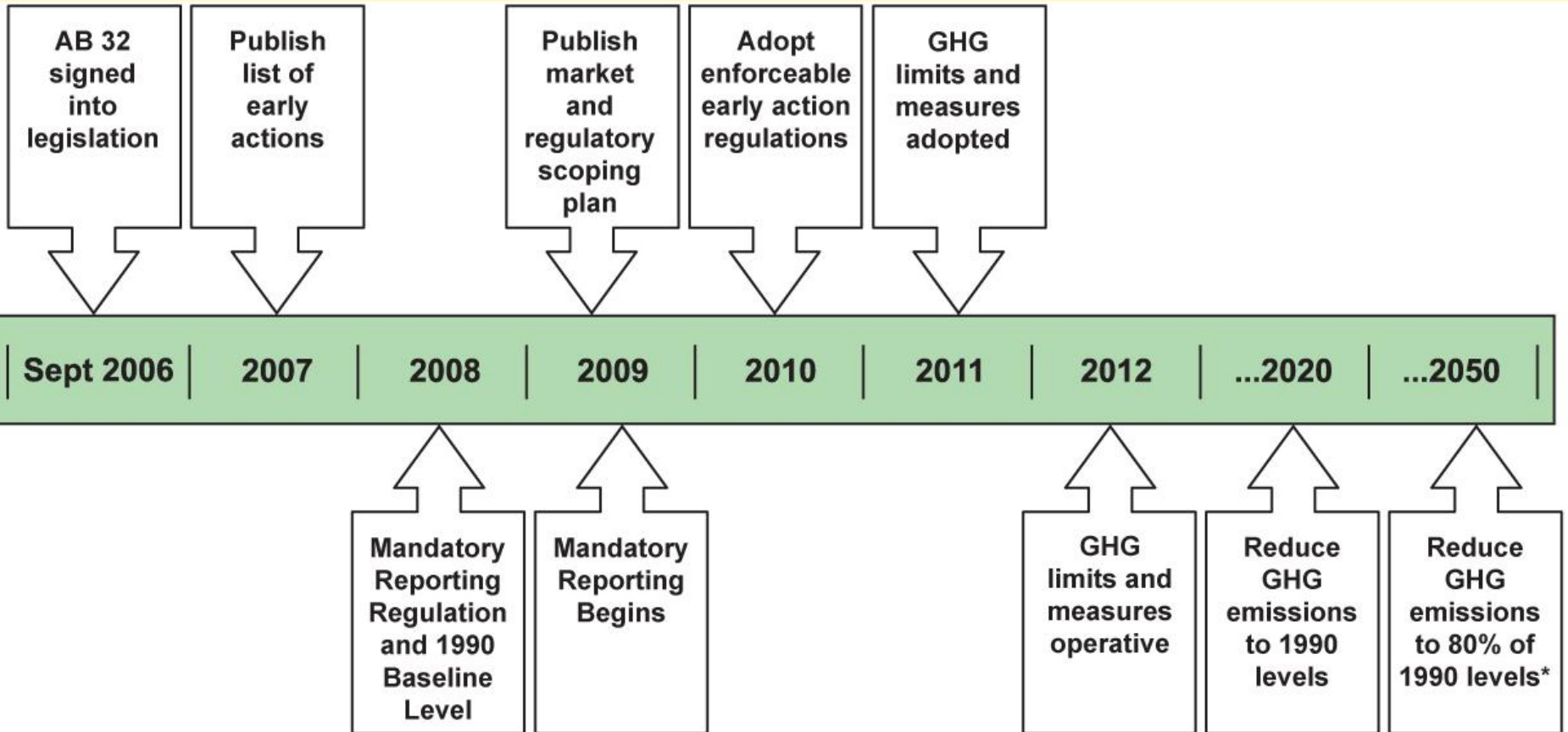
- Signed by Governor Schwarzenegger
- First state in USA with mandatory reporting program
- California frequently serves as the “incubator” for federal environmental laws and programs
- California Air Resources Board (CARB) is the agency responsible for implementation



AB 32 Overview

- Goal is to reduce GHG emissions statewide to achieve 1990 levels by 2020:
 - Legislation passed on January 1, 2006
 - Early actions were published in 2007
 - Mandatory reporting began for CY 2008 in 2009
 - Adopt enforceable early action regulations in 2010
 - Adopt GHG limits and measures in 2011
 - GHG limits and measures become operable in 2012 (cap-and-trade program)

GHG Timeline For California:



* NOTE: 2050 goal is a result of Executive Order S-3-05, not AB 32.



AB 32 Overview

<i>GHG</i>	<i>GWP</i>
CO_2	1
CH_4	21
N_2O	310
SF_6	23,900
<i>Hydrofluorocarbons (HFCs)</i>	<i>Varies: 12 – 11,700</i>
<i>Perfluorocarbons (PFCs)</i>	<i>Varies: 6,500 – 8,700</i>



AB 32 Overview

Key Definitions:

- Global Warming Potential (GWP) measures how much each GHG contributes towards global climate change in relationship to the effect of CO₂.
- CO₂e refers to “carbon dioxide equivalents”; this converts all GHGs to a single unit based on GWP
- 1 Metric tonne = 1 MT = 2204 lbs = 1,000 Kg
- For example:
 - 1 MT of CO₂ produces 1 MT of CO₂e
 - 1 MT of methane produces 21 MT of CO₂e
 - 1 MT of SF₆ produces 23,900 MT of CO₂e



AB 32 Overview

Mandatory Reporting



AB 32 Overview

Who needs to submit mandatory reports online?

1. Cement plants
2. Electric generating facilities and cogen plants
 - *Facilities $\geq 1MW$ and $\geq 2,500 MT CO_2/yr$*
3. Electrical retail providers and marketers
4. Oil refineries, hydrogen plants and general stationary combustion (GSC) sources
 - *Facilities $\geq 25,000 MT CO_2/yr$*

Type of Facility	How Many Reported for CY 2008?
Hydrogen Plants	6
Cement Plants	11
Petroleum Refineries	22
Other	23
Electricity Marketer	30
Cogen Facilities	59
Retail Electricity Providers	61
General Stationary Combustion	183
Electricity Generation	209
TOTAL	605



AB 32 Overview

Typical GSC Sources:

- Natural gas transmission
- Industrial gases
- Paperboard manufacturing
- Colleges and universities
- Oil production
- Food processing
- Steel foundries
- Mineral processes
- Glass containers
- Malt beverages
- Other large combustion sources



AB 32 Overview

Exempt Sources:

- Facilities
 - Electricity generating facilities solely powered by nuclear, hydroelectric, wind or solar
 - Hospitals; primary and secondary schools
- Equipment
 - Portable equipment
 - Emergency generators
 - Mobile sources (on-road and off-road)



AB 32 Overview

Annual Deadlines for Online Reporting to CARB:

April 1st

- GSC (except oil and gas sector)
- Electricity generating and cogeneration facilities not part of reports due on June 1st

June 1st

- Electricity retail providers and marketers
- Cement plants
- Petroleum refineries
- Hydrogen plants



AB 32 Overview

GHG Information Management Plan:

1. Operator shall maintain a GHG inventory program that includes emissions calculations and electricity transactions which need to be: transparent, accurate and independently verifiable
2. Operator will establish, document, implement and maintain data acquisition and handling activities



AB 32 Overview

GHG Information Management Plan (con't):

3. Includes measuring, monitoring, analyzing, recording, processing and calculating parameters required by AB32
 - Includes calibration methods & results, equipment specs, analytical results
4. Operator will implement internal audit and QA/QC procedures



AB 32 Overview

Recordkeeping and Documentation

1. Operator must establish and maintain procedures for document retention and recordkeeping
2. Keep records for 5 years following submittal of report
3. Log must be kept to document all procedural changes made in GHG accounting methods and instrumentation



AB 32 Overview

Verification

1. Verification opinion due within 6 months following report due date (e.g., Oct 1st or Dec 1st)
2. Frequency is either annually or triennially depending on type of industry and whether previous verification opinion was positive or negative



AB 32 Overview

Verification (con't)

3. Must use independent verifier with no conflict of interest
4. ARB has published list of accredited verifiers and verification bodies (VBs) on its website:
<http://www.arb.ca.gov/cc/reporting/ghg-ver/ghg-ver.htm>

Facility Type	Annual Verification Costs (\$)	
	Low	High
Hydrogen Plants	2,000	5,000
Cement Plants	3,000	8,000
Petroleum Refineries	10,000	40,000
Cogen Facilities	2,000	8,000
Retail Electricity Providers	10,000	40,000
General Stationary Combustion	1,000	3,000
Electricity Generation	4,000	7,000

Source: EPA. Review of Verification Systems in Environmental Reporting Programs. February 10, 2009.



AB 32 Overview

Command-and-Control Rules



AB 32 Overview

GHG Reduction Measures:

- Scoping Plan by CARB contains 73 GHG reduction measures
- 44 are early action measures (EAMs) with effective dates beginning 2010
- Many are command-and-control type rules, others are voluntary
- Applicability is independent from mandatory reporting thresholds and determinations
- Rule-making and public hearings are ongoing with CARB



AB 32 Overview

Complete list and schedule updated by CARB several times each year:

- http://www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf
- Most recent update was 10-1-09
- Let's look at one – High GWP Refrigerant Management



AB 32 Overview

Stationary Equipment Refrigerant Management:

- Scheduled for adoption in Dec 2009 by CARB
- For air conditioning and refrigeration systems with >50 lbs of refrigerant with GWP >150:
 - Requires leak detection, monitoring and repair beyond federal and SCAQMD rules
 - Registration and payment of fees



AB 32 Overview

Stationary Equipment Refrigerant Management:

- Facilities impacted:
 - Cold storage warehouses
 - Grocery stores/supermarkets
 - Food preparation/processing/service
 - Process cooling
 - Pharmacies
 - Large convenience stores

Size	Pounds of Refrigerant	Number of Facilities Affected (as estimated by CARB)		
		Refrigeration Systems	AC Systems	Subtotal
Large	>2000	2,000	2,700	4,700
Medium	200-1999	8,500	6,300	14,800
Small	50-199	15,500	14,000	29,500
TOTALS		26,000	23,000	49,000

Regulatory Requirement	Refrigerant Charge		
	Large (>2000 lbs)	Medium (200-1999 lbs)	Small (50-199 lbs)
Registration	3-1-2012	3-1-2014	3-1-2016
Recordkeeping	2011	2011	2011
Leak Detection & Monitoring	Automatic	Quarterly Inspections	Annual Inspections
Fees	\$370	\$170	\$0
1 st Reporting	2012	2014	N/A



AB 32 Overview

Cap-and-Trade Program



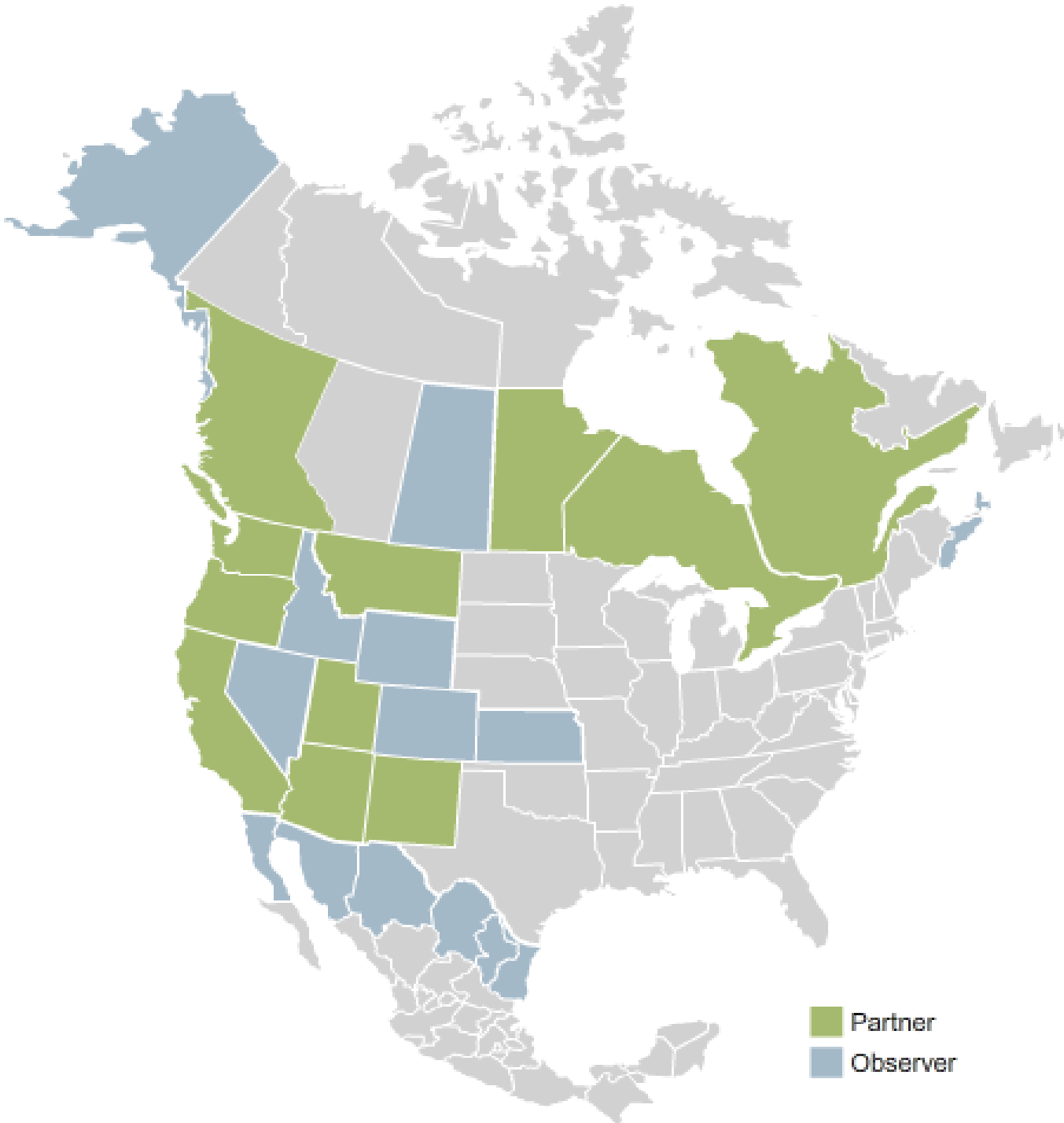
AB 32 Overview

Cap-and-Trade

- CARB is still designing its program
- Regulation adoption date is 1-1-2011 with program effective date of 2012
- Close coordination with Western Climate Initiative (WCI) program and timeline
- Linkage to other regional and state programs is an important consideration

Western Climate Initiative (WCI) Partners and Observers

Source: WCI
website accessed
on 10-1-09 at
<http://www.westernclimateinitiative.org/>





AB 32 Overview

CARB's rule-making timeline:

- 2009: evaluate issues and policy decisions
- 2010: finalize program design and develop regulatory language
- Public participation is critical
- Industry wants recognition and credit for early actions



AB 32 Overview

Differences Between CARB and WCI:

- WCI includes 20 more processes and fugitive sources than CARB
- WCI will require annual verification for GSC instead of triennial per CARB
- WCI will grandfather verifiers who are accredited by ANSI or SCC whereas CARB has its own accreditation system



AB 32 Overview

Differences Between CARB and WCI (con't):

- WCI sees benefit of lowering the reporting threshold to 10,000 MT CO₂e
- Need alignment of reporting and verification schedules
- Add upsteam fuel sources before 2015



AB 32 Overview

Conclusion and Summary About CARB:

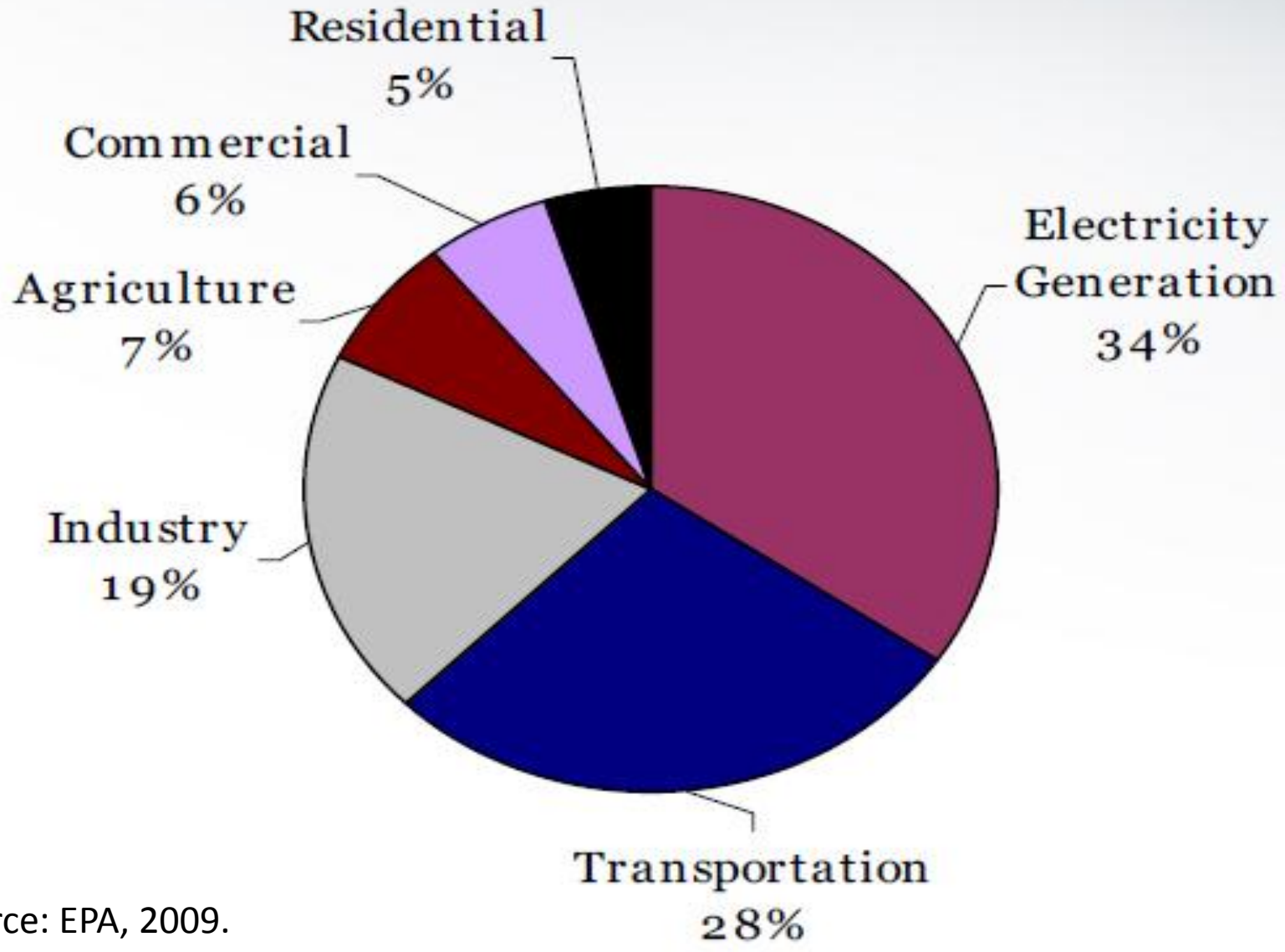
- AB 32 is a strong GHG reduction and mgmt program with multiple approaches
- Agency personnel want autonomy to regulate GHGs on a more stringent basis than federal programs



Overview of EPA Rule

Major Provisions

Emissions (CO₂e) Allocated to Economic Sectors



Source: EPA, 2009.



Overview of EPA Rule

Major Provisions:

- Mandatory GHG Reporting Rule signed on 9-22-09 with a targeted effective date of 1-1-10
- Estimated to affect 10,152 facilities
- Compliance cost is estimated to be:
 - \$132 million in the first year
 - \$72 million in subsequent years
- EPA does not preempt state programs
- EPA does not delegate authority to states



Overview of EPA Rule

Major Provisions (con't):

- Facilities will report directly to EPA using an online web-based reporting tool
- EPA is working with state and regional reporting programs to minimize reporting burden and duplication of effort to the extent possible
- EPA's intent is to collect GHG data to enable future decision-making and rule-making



Overview of EPA Rule

Major Provisions (con't):

- EPA provides lots of help.
- There are upcoming webinars, training sessions and outreach programs.
- I find these Info Sheets to be very helpful:

http://www.epa.gov/climatechange/emissions/ghg_infosheets.html



Overview of EPA Rule

Three Major Source Categories:

- Upstream Sources – Suppliers of fuels, petroleum products, natural gas, industrial GHGs and CO₂.
- Downstream Sources – Typical industrial facilities (e.g., petroleum refinery, GSC, etc.)
- Mobile Sources – vehicles and engines out of light-duty sector



Overview of EPA Rule

Facilities Subject to Reporting:

- EPA evaluated 692,068 facilities in 29 sectors
- EPA's intent is to capture >85% of GHG emissions by regulating 10,132 facilities
- Threshold is 25,000 MT CO₂e or an equivalent threshold based on sector metrics
- EPA doesn't intend to capture residential or small businesses that contribute insignificant amounts of GHGs

Sector	Number of Entities	Number of Entities Covered
GSC	350,000	3,000
Landfills	7,800	2,551
Suppliers of Natural Gas	1,502	1,502
Electricity Generation	1,108	1,108
Pulp & Paper	425	425
Mobile Sources	NA	317
Suppliers of Petroleum	364	315
Suppliers of Industrial Gases	383	167
Petroleum Refineries	150	150
Remaining Sectors	330,336	617
TOTAL	692,068	10,152



Overview of EPA Rule

Mandatory Reporting Not Required for:

- Portable equipment
- Emergency generators and equipment
- Agricultural irrigation devices
- Flares (unless required under a specific subpart)
- Hazardous waste combustion units (co-fired with fossil fuels only)
- Fleet vehicles

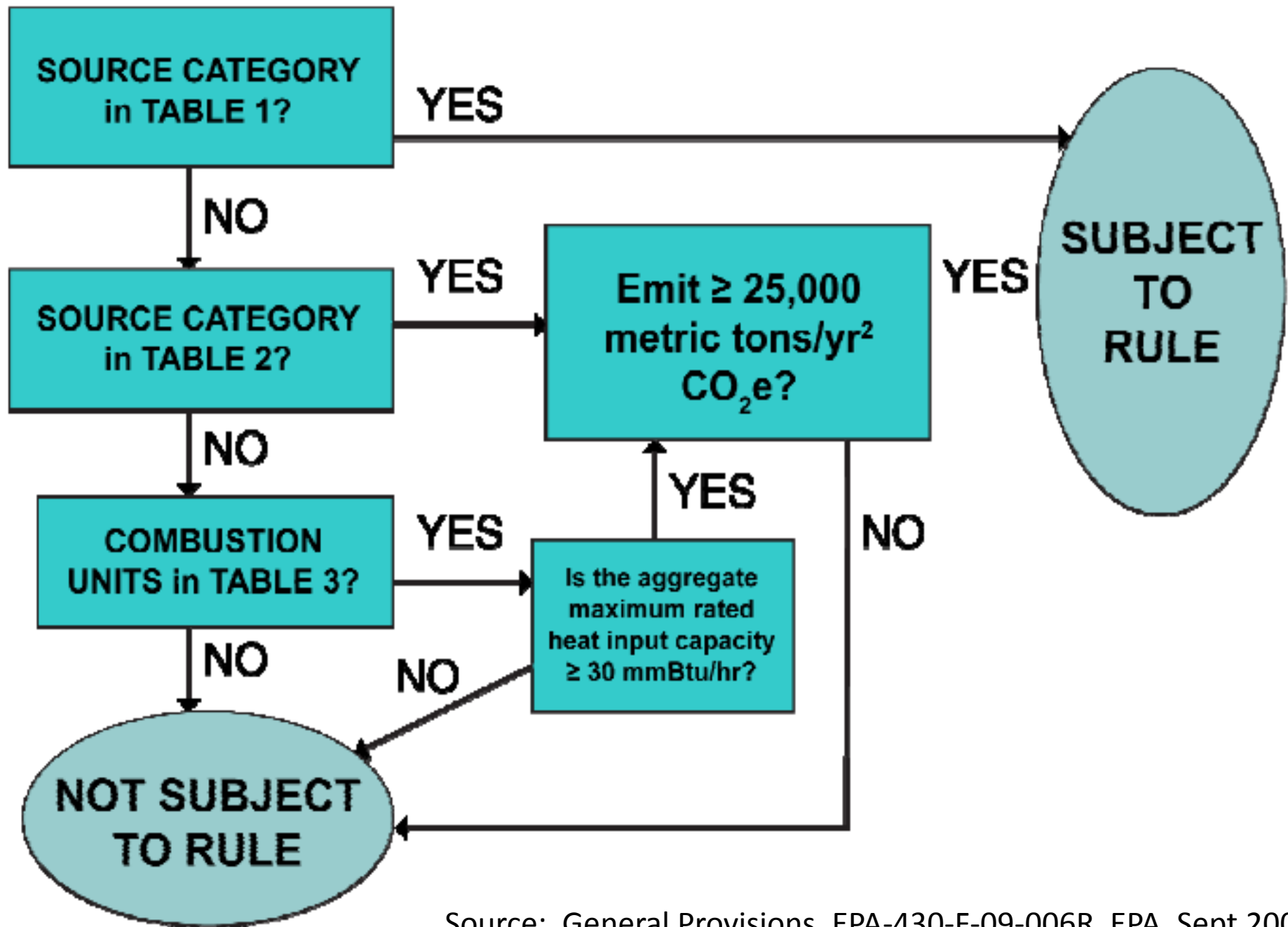
Deadline	Action / Requirement
1-1-10	Begin collecting data using best available monitoring methods
1-31-10	Deadline for submitting application to extend use of best available monitoring methods
3-31-10	Monitoring equipment installed and calibrated
12-31-10	Complete 2010 data collection
1-30-11	Submit certificate of representation
3-31-11	Submit GHG report for 2010



Overview of EPA Rule

Applicability Determination:

- Five different applicability determinations
- Five tables of source categories
- Let's look at the decision flowchart and then discuss each one....



Source: General Provisions, EPA-430-F-09-006R, EPA, Sept 2009.



Overview of EPA Rule

Applicability Determination:

1. “All-in” Category

- If the facility contains any of the source categories listed in Table 1, then it must report emissions from all source categories for which calculation methodologies are provided in any subpart of the rule.
- 17 sectors covered



Overview of EPA Rule

Table 1:

- Adipic Acid Production
- Aluminum Production
- Ammonia Manufacturing
- Cement Production
- Electricity Generation
- HCFC-22 Production
- HFC-23 Destruction
- Lime Manufacturing
- Manure Management Systems



Overview of EPA Rule

Table 1 (con't):

- MSW Landfills
- Nitric Acid Production
- Petrochemical Production
- Petroleum Refineries
- Phosphoric Acid Production
- Silicon Carbide Production
- Soda Ash Production
- Titanium Dioxide Production



Overview of EPA Rule

Applicability Determination:

2. Combined Emissions:

- If the facility *emits >25,000 MT CO₂e in combined emissions* from the source categories listed in Table 2, then it must report emissions from *all* source categories for which calculation methodologies are provided in *any* subpart of the rule.
- 7 sectors listed



Overview of EPA Rule

Table 2:

- Ferroalloy Production
- Glass Production
- Hydrogen Production
- Iron and Steel Production
- Pulp and Paper Manufacturing
- Zinc Production



Overview of EPA Rule

Applicability Determination:

3. Stationary Combustion Emissions:

- If the facility emits >25,000 MT CO₂e in combined emissions from its stationary combustion sources in Table 3, then it must report emissions from stationary combustion devices only.
- 5 sectors listed
- If aggregate maximum-rated heat-input capacity is <30 MMBtu/hr, then facility is exempt.



Overview of EPA Rule

Table 3:

- Boilers
- Stationary Internal Combustion Engines
- Process Heaters
- Combustion Turbines
- Other Stationary Fuel Combustion Equipment but excluding:
 - Portable equipment
 - Emergency Generators
 - Agricultural irrigation pumps
 - HW waste combusters
 - Flares



Overview of EPA Rule

Applicability Determination:

4. Per Table 4, suppliers of fossil fuels must report the annual quantities supplied into the economy plus the GHG emissions associated with complete oxidation of these fuels:
 - Coal-based liquid fuels
 - Natural gas and natural-gal liquids
 - Petroleum Products



Overview of EPA Rule

Applicability Determination:

5. Per Table 5, suppliers of industrial GHGs must report quantities of each gas supplied and the emissions associated with their complete release:
 - Fluorinated gases
 - Nitrous oxide
 - Carbon dioxide



Overview of EPA Rule

Calculating Emissions:

- Each subpart of the rule (for each sector) has its own equations and methodology
- Regulations are very prescriptive (711 pgs)
- In general, meters and readings should be accurate to +/- 5% of the true value
- Pay attention to frequency of monitoring and required recordkeeping



Overview of EPA Rule

Differences Between CA and EPA Rules



Overview of EPA Rule

EPA added two additional GHGs to their list:

GHG	GWP	Uses
HFE	11 - 14,900	Refrigerant, degreasing solvent, heat transfer fluid, anesthetic
NF ₃	17,200	Semi-conductor manufacturing



Overview of EPA Rule

Issue	EPA	CA
Source/Sector Categories	29	4
Cogen Facilities	No threshold	Separate threshold – 2,500 MT CO ₂
Threshold Determination	CO ₂ e	Only CO ₂
Landfills	Must report GHG emissions	Regulated under landfill gas capture and control rule



Overview of EPA Rule

Issue	EPA	CA
Abbreviated Report	Allowed in 2010 for GSC	Allowed for cogen <10 MW and 2,500 MT CO ₂
Annual Deadline	March 31st	April 1 st or June 1 st
Upstream Fuel Suppliers	Must report	Exempt
Missing Data Computations	Specified by EPA	Left to discretion of facility



Overview of EPA Rule

Issue	EPA	CA
Internal Audit	No requirement	Required
Certificate of Representation	Required	No requirement
Verification	EPA staff	3 rd party
Written QAPP	Required	Less formal
Biogenic emissions	Optional – can include	Included but can denote



Overview of EPA Rule

Issue	EPA	CA
Primary Schools	Not exempted	Exempted
Hospitals	Not exempted	Exempted
R&D Activities	Exempt	No specific exclusion
De Minimus Category	None	<3% of emissions not to exceed 20,000 MT CO ₂



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