

# Overview of the California Registry

**Denver, Colorado**

**July 17, 2006**

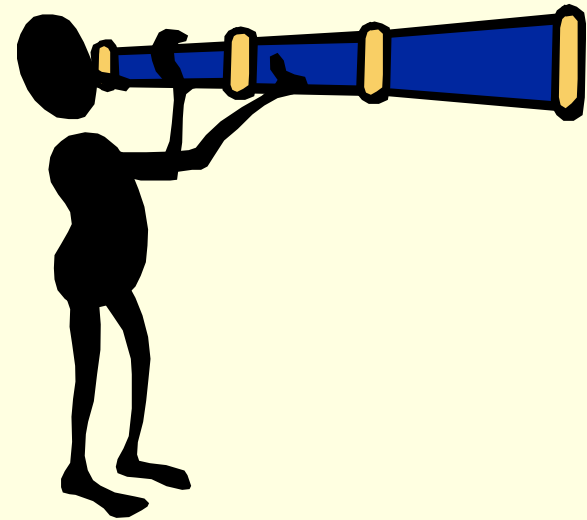


# Overview



- Introduction to the Registry and its members
- Registry Program:
  - Reporting Requirements
  - Reporting Tools
    - General Reporting Protocol
    - Power/Utility Reporting Protocol
    - CARROT
- Overview of Certification
- The Registry and mandatory reporting

# Introduction to the Registry



# California Climate Action Registry



- Established as a business initiative
- Nonprofit organization created by state legislation
  - Board represents business, government, NGOs
  - Voluntary
- Operations began September 2001
- Official launch October 2002
  - **23 members**

# Goals of the Registry



- Help companies and organizations establish GHG emissions inventories and baselines against which any future GHG emission reduction requirements may be applied.
- Encourage voluntary actions to:
  - Increase energy efficiency
  - Decrease GHG emissions

# Baseline Protection



The State “commits to use its best efforts to ensure that organizations that establish greenhouse gas emissions baselines and register emissions results... receive appropriate consideration under any future international, federal, or state regulatory scheme.”

# Registry's Relationship to State



- **California Energy Commission (CEC)**
  - SB 1771 and 527:
    - Provide technical guidance to Registry for reporting, metrics, approve technical assistance providers
    - Approve certifiers and oversee certification activities
    - Assist with public review of Registry Protocols
- **Air Resources Board (CARB)**
  - AB 1493: develop guidance for GHG emissions from mobile sources
- **Department of Forestry (CDF)**
  - SB 812: Develop guidance for reporting GHG emission reduction projects
    - Emphasis on CA forest conservation and management

# How much data is certified?



- 162 million metric tons CO<sub>2</sub>e certified
  - Calendar Years 2000 – 2004
- About half is from outside of California



# Registry Members



## Air Districts

Bay Area AQMD  
Mojave Desert AQMD  
Sacramento Metro AQMD  
South Coast AQMD

## Cities

City of Chula Vista  
City of Los Angeles  
City of Palo Alto  
City of Sacramento  
City and County of San Francisco  
City of Santa Monica  
City of West Hollywood

## Education

Los Angeles Community College District  
University of California, Davis  
University of California, San Diego  
University of California, Santa Barbara

## Electric Power

AES  
Calpine Corporation  
Mirant  
Reliant Energy  
West Coast Power

## Federal Government

United States Air Force, Space and Missile Command

80 members total

# Registry Members



## Forestry

California Department of Forests  
Collins Pine Company  
The Conservation Fund  
Van Eck Foundation

## Food Processing

Clif Bar & Co.

## Health Care

Catholic Healthcare West  
Genentech  
Guidant

## Investor-Owned Utilities

Pacific Gas and Electric  
PacifiCorp  
San Diego Gas & Electric  
Southern California Edison  
Southern California Gas Company

## Manufacturing

Bentley Prince Street  
Cenveo Anderson Lithograph  
Clipper Windpower  
Corning Incorporated  
Eastman Kodak  
Hewlett-Packard

## Mining

Rio Tinto Borax

# Registry Members



## Non-Profit Organizations

Energy Foundation  
Environmental Defense  
Natural Resources Defense Council  
Pacific Forest Trust  
The Climate Trust  
Union of Concerned Scientists

## Oil/Gas

BP  
Shell Oil Company

## Ports

Port of Los Angeles

## Public Utilities

Austin Energy  
Anaheim Public Utilities  
Burbank Water and Power  
East Bay Municipal Utility District  
Glendale Water & Power  
Los Angeles Department of Water and Power  
Northern California Power Agency  
Pasadena Water & Power  
Platte River Power Authority  
Riverside Public Utilities  
Sacramento Municipal Utility District  
Silicon Valley Power

# Registry Members



## Services

Ace Technologies

AgCert

Better World Group

Constructive Technologies Group

Enviance

Environmental Software Providers

ICF Consulting

Science Applications International Corporation

## State Government

California Energy Commission

California Environmental Protection Agency

California Public Employees Retirement System

## State Government (*cont'd*)

California Public Utilities Commission

California State Teachers Retirement System

## Solid Waste

Waste Management, Inc.

## Transportation

AC Transit

## Telecommunications

AT&T

QUALCOMM

Verizon

# What are the business benefits of joining?



- Protection for early action
- Prepare for trading
- Access to CARROT
- Build environmental reputation
- Protection from shareholder resolutions
- Be a part of the policy dialogue
- Use of “Climate Action Leader” logo





“Our participation in the Registry helps me do my job better. I regularly get inquiries about Edison’s GHG emissions—from management, the press and from our customers. With the Registry’s rigorous protocols and certification, I’m ready with accurate and detailed information.”

**Howard Gollay, Southern California Edison**

# What does it cost?

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- Membership fee
- Certification
- Internal costs

# Annual Three Step Process

1. **Calculate** GHG emissions according to the Registry protocols
  - CO<sub>2</sub> first 3 years, then all 6 Kyoto gases (CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>)
  - Direct stationary, mobile, process and fugitive emissions
  - Indirect emissions from energy purchases
  - Does not include emissions from product use
2. **Report** GHG emissions data through CARROT
3. **Certify** emissions inventory results using Registry-approved certifiers
  - Certified data is publicly reported through [www.climateregistry.org](http://www.climateregistry.org)



# General Reporting Protocol



- Operational handbook for reporting
  - Based on international standard, World Resources Institute/World Business Council for Sustainable Development *GHG Protocol*
- Organic document that incorporates new knowledge
  - Current version at [www.climateregistry.org/PROTOCOLS](http://www.climateregistry.org/PROTOCOLS)
- Recognized as a “gold standard” for reporting

# Industry-Specific Protocols



- Cement
- Electric power generation, transmission & distribution
- Forestry
  - Biological and non-biological emissions
    - Forest management projects
    - Afforestation
    - Conservation
- In development:
  - Oil and gas production
  - Natural gas transmission and distribution
  - Agriculture
  - Solid waste

Available at [www.climateregistry.org/PROTOCOLS](http://www.climateregistry.org/PROTOCOLS)

# Certification Protocols



- *Certifier's* guidance for assessing compliance with Registry reporting requirements
  - Companion document to the General Reporting Protocol and industry protocols
  - Outlines certification process and certification activities
  - Useful reference for participants
  
- Organic document
  - Available at [www.climateregistry.org/PROTOCOLS](http://www.climateregistry.org/PROTOCOLS)
  - To be updated Summer/Fall 2006

# Member Services



- New member orientation sessions
- CARROT training & technical support
- Internship facilitation
  
- Newsletter
- Annual conference
- Best practices workshops and field trips
- Policy conference calls and science seminars
  
- Annual awards for environmental leadership
- Promotion of members in news media



# Registry Program Overview

# Program Overview



Make reporting decisions	<b>First year only</b>
Develop Information tracking systems	<b>First year only</b>
<b>CALCULATE</b> emissions	Annually (January-April)
<b>REPORT</b> emissions using CARROT	Annually (May-August)
<b>CERTIFY</b> emissions report	Annually (September-December)

# Reporting Decisions



## Year 1:

1. What is the *geographic scope* of reporting?
2. What *GHGs* to report?
3. How do you track *ownership*?
4. How will you use *CARROT*? – to track GHGs at a source, facility or entity level?
5. Will you specify a *baseline*?

## Each Year:

6. *HR Decisions* -- who is going to do the work?
7. *Workflow* – planning for deadlines

# Reporting Decision 1: *Geographic Scope*

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1. All California emissions
2. All US emissions (w/CA broken out)
3. All Worldwide emissions
  - US emissions (w/CA broken out) – certified & publicly reported
  - International emissions - optional



# Reporting Decision 2: *GHGs*



CO<sub>2</sub>

HFCs

CH<sub>4</sub>

PFCs

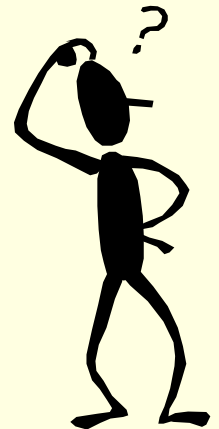
N<sub>2</sub>O

SF<sub>6</sub>

- Years 1-3: At least CO<sub>2</sub>
  - Can be CO<sub>2</sub> + any other gas(es)
- Years 4+: All 6 Kyoto Gases

# What is *de minimis*?

- Intent: alleviate administrative burden of accounting for a relatively insignificant amount of emissions
- Optional to report emissions below de minimis threshold (<5% of total emissions)
  - From one or more sources
  - From one or more gases
  - Combination of sources and gases
- Required to report **at least** 95% of total emissions when summed across all sources



100% = Direct + Indirect + De Minimis (<5%)

# What is *de minimis*? (example)

Source	CO <sub>2</sub> Emissions (metric tons)	CH <sub>4</sub> Emissions (metric tons CO <sub>2</sub> e)	Total Source Emissions (metric tons CO <sub>2</sub> e)
Source 1	39,900	100	40,000
Source 2	29,900	100	30,000
Source 3	19,900	100	20,000
Source 4	3,000	7,000	10,000
Total			<b>100,000</b>
De Minimis Threshold			<b>5,000</b>
De minimis emissions = 3,300			
Reported emissions = 96,700			

# Candidates for *de minimis*?



- Mobile sources, especially non-CO<sub>2</sub> gases
- Fuel storage (coal piles)
- HFCs (HVAC systems)

# Reporting Decision 3: *Ownership*

## 3. Equity Share and/or Management Control?

### ■ Equity Share

- Report share of organization's emissions proportional to ownership
  - Must disclose other owners in report

### ■ Management Control

- Report 100% of the organization's emissions, when own >50%

- Use method standard for industry
- Use same method for all sources

# Ownership (example)

Participant	Facility	Management Control Reporting Requirements	Equity Share Reporting Requirements
Company A	55% ownership	100%	55%
Company B	30% ownership	0%	30%

# Reporting Decision 4: *Using CARROT*

## 4. Entity or Facility Data in CARROT

- **Entity:** an organization in its entirety  
(corporation, city or county, non-profit organization, etc.)
  - Entity-level reporting is *required*
  - Must report the entire organization's total emissions

-OR-

- **Facility:** sub-entity – report emissions of site, business unit (manufacturing plant, department, etc.)
  - Facility-level reporting encouraged
  - Facility emissions must equal entity emissions (must report all sub-entities)

# Reporting Decision 5: *Baseline*



- Optional
- Must re-adjust baseline when cumulative changes reach 10% due to:
  - Structural Changes to Entity
    - Mergers and Acquisitions
    - Divestitures
    - Outsourcing
    - Insourcing
  - Shift of Emission Sources
  - Improved GHG Accounting Methodologies
- Direct emissions baseline year may be different than indirect emissions baseline



# Reporting Decision 6: *HR – Who does what?*

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- Primary Contact:
  - EHS staff
  
- Additional resources:
  - Facility Manager
  - Energy Manager
  - Accounting Department
  - Fleet Manager

# Reporting Decision 7: *Workflow*



## ■ Registry Deadlines:

- Reporting Deadline: August 31 (Data year + 1)
- Certification Deadline: December 31 (Data year + 1)

### EX: 2005 Emissions

Reported by **Aug. 31, 2006**

Certified by **Dec. 31, 2006**

## ■ Other Reporting Rules:

- Report for each year of participation (no breaks in reporting)
- Can report from present back to 1990

# Calculating Emissions

# Required Sources

- Direct Emissions from:
  - Mobile Sources
  - Stationary Sources
  - Process Emissions
  - Fugitive Emissions
  
- Indirect Emissions from:
  - Electricity purchased and consumed
  - Purchased Co-Generation, Imported Steam, and District Heating and Cooling

***Calculating GHG Emissions:***

**Annual Consumption x Emission Factor = Annual Emissions**



# Direct Emissions: Stationary Combustion



- Non-mobile sources emitting GHGs from fuel consumption
  - Boilers, turbines, Internal combustion engines, flares, etc.
  
- Two methods:
  - Must report using same method each year
    1. Measurement
      - *Recommended if CEMS required under 40 CFR Part 75*
    2. Fuel Use calculation



# Direct Emissions: Stationary Combustion



- Method 1: **Measurement-based methodology (CEMs)**
  1. Specify configuration:
    - CO<sub>2</sub> CEMS or O<sub>2</sub> CEMS
  2. Subtract any biomass CO<sub>2</sub> from CEMS total CO<sub>2</sub>
    - If MSW, calculate CO<sub>2</sub> from combustion of fossil fuel origin waste (e.g., plastic, rubber)

## ***Example:***

### **Step 1: Calculate biomass CO<sub>2</sub>**

1,000,000 MMBtu x 90.94 kg CO<sub>2</sub>/MMBtu = 90,940 metric tons CO<sub>2</sub>

### **Step 2: Subtract biomass CO<sub>2</sub> from CEMs CO<sub>2</sub>**

8,000,000 tons – 90,940 tons CO<sub>2</sub> = 7,909,060 metric tons CO<sub>2</sub>



# Direct Emissions: Stationary Combustion



## Method 2: Fuel use

1. Obtain fuel use data
  - On-site measurement OR
  - Annual mass balance
2. Select Emission Factor (using higher heating value (HHV))
  1. Periodic source testing OR
  2. Equipment manufacturer data OR
  3. Default emission factors
3. Calculate emissions by fuel:
  - Annual consumption x emissions factor = CO<sub>2</sub> or CO<sub>2</sub>e emissions

### ***Example:***

9,460,000 MMBtu x 93.51 kg CO<sub>2</sub>/MMBtu = 84,604.6 metric tons CO<sub>2</sub>



# Direct Emissions: Mobile Combustion



- Non-fixed sources
  - autos, motorcycles, boats, airplanes, etc.
- Method 1: **Annual Fuel Consumption**  
(CO<sub>2</sub>)
  - Identify total annual fuel consumption by fuel type.
  - Select appropriate CO<sub>2</sub> factor
  - Fuel consumption x emission factor = Total CO<sub>2</sub> emissions
    - Easiest to calculate mobile combustion emissions using this method

## ***Example:***

10,000 gallons x 8.78 kg CO<sub>2</sub>/gallon = 87.81 metric tons CO<sub>2</sub>





# Direct Emissions: Mobile Combustion



## ■ Method 2: Annual mileage for CO<sub>2</sub>

For each vehicle:

- Identify vehicle type, fuel, model year and annual mileage to find average fuel efficiency ([www.fueleconomy.gov](http://www.fueleconomy.gov))
- Miles x (45% x city fuel efficiency)(55% x hwy fuel efficiency)
- Annual gallons x emission factor = Total CO<sub>2</sub>



# Direct Emissions: Mobile Combustion



- Method 2: **Annual mileage** for **CH<sub>4</sub>**, **N<sub>2</sub>O**
  - For each vehicle, identify the appropriate emission factor:
    - Select vehicle type
    - Select model year
  - Annual mileage x emission factor = Total CH<sub>4</sub> or N<sub>2</sub>O emissions
  - Convert to CO<sub>2</sub>e emissions
  
- Good candidate for *de minimis*?

# Direct Emissions: Process Emissions Specific to Participant



- Emissions from chemical or physical processes other than combustion
  - SO<sub>2</sub> scrubbers
  - Hydrogen production
  - IGCC
  - Industry-specific processes?
- CEMs may capture CO<sub>2</sub> from the processes
  - Report process CO<sub>2</sub> distinct from stationary combustion CO<sub>2</sub>
- GRP provides references for some calculations
- Certifier uses professional judgment to assess if methodologies/emission factors appropriate

# EXAMPLE:

## Process Emissions from SO<sub>2</sub> Scrubbers

- Mass balance calculation
  1. Determine annual usage of sorbent (CaCO<sub>3</sub>)
  2. Determine ratio of molecular weight of CO<sub>2</sub> to sorbent
  3. Calculate annual usage and convert to metric tons

### ***Example:***

$$10,000 \text{ tons CaCO}_3 \times .44 \times 0.907 = 3,991 \text{ metric tons CO}_2$$

# Direct Emissions: Fugitive



- Majority of fugitive emissions are specific to industrial sectors or processes
  - Guidance for CH<sub>4</sub> emissions from natural gas pipelines in development
- 1. GRP: guidance for *estimating* fugitive emissions from **refrigeration systems** and **fire suppression equipment**
- 2. PUP: calculating fugitive SF<sub>6</sub> from electricity T&D

*Annual releases x emission factor = Total emissions*



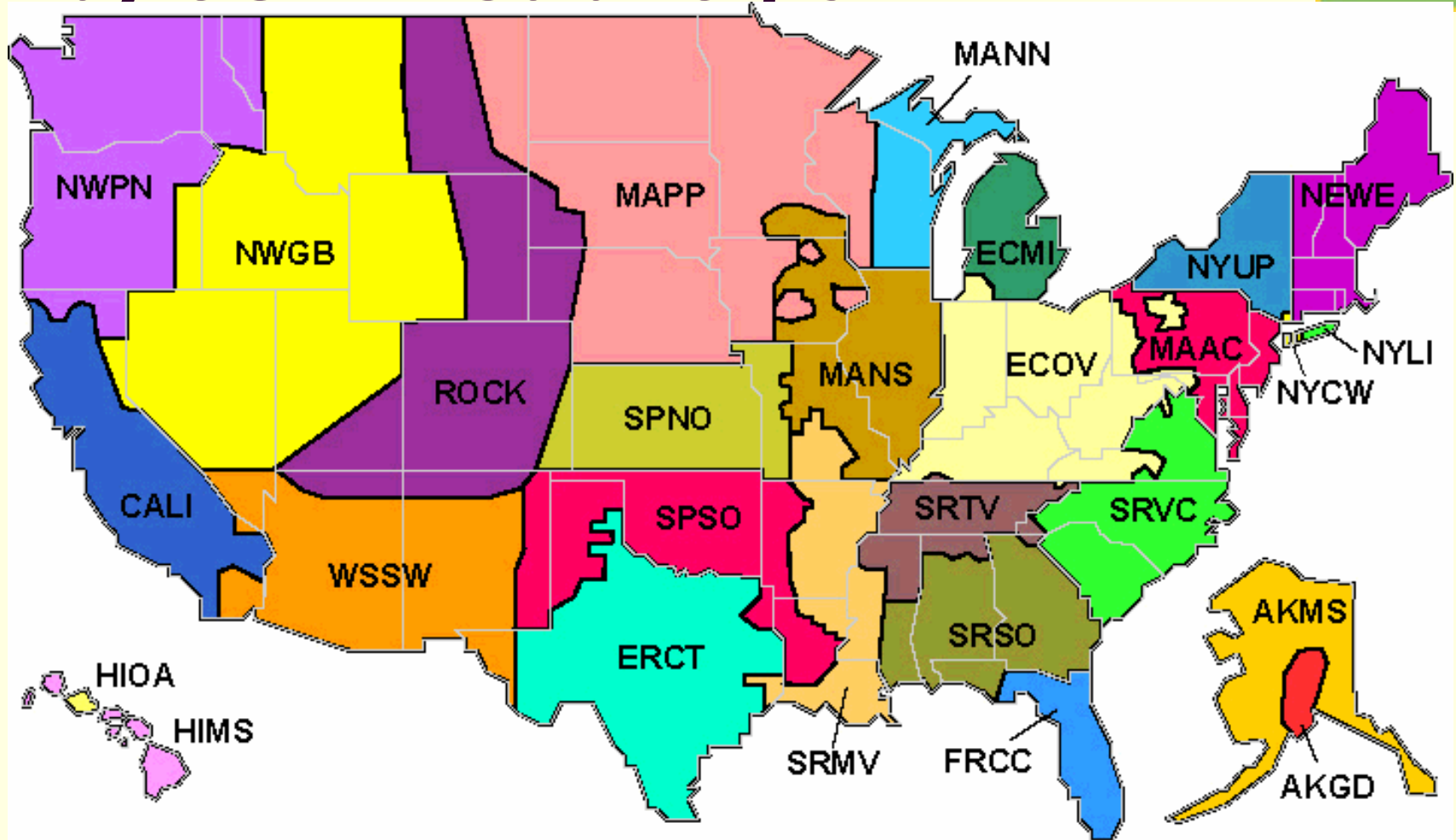
# Indirect Emissions: Electricity Use

1. Determine annual electricity usage that is purchased and consumed
2. Apply electricity emission factor
  1. CO<sub>2</sub> - eGRID subregion – see next slide
  2. CH<sub>4</sub>, N<sub>2</sub>O – EIA state specific
3. Calculate total annual emissions (metric tons)
4. Convert non-CO<sub>2</sub> gases to CO<sub>2</sub> equivalent
5. Total all CO<sub>2</sub> and non-CO<sub>2</sub> gases

## **Example:**

$$50,000 \text{ kWh} \times 0.805 \text{ lbs CO}_2/\text{kWh} = 15.04 \text{ metric tons CO}_2$$

# Electricity emission factors (CO<sub>2</sub>) by eGRID sub-region



# Metrics



- Optional to report normalized emissions performance
  - AKA emissions efficiency metrics
  - AKA carbon intensity metrics
  
- Consider:
  - Total Energy (lbs CO<sub>2</sub>/Joule)
  - Production (lbs CO<sub>2</sub>/unit of product shipped)



# Metrics – Selected Power/Utility Reporters



*(lbs CO<sub>2</sub>/MWh) from Electricity*

	<u>Deliveries</u>	<u>Generation</u>	<u>Fossil Generation</u>
Calpine	n.a.	650	905
LADWP	1365	1562	1831
PacifiCorp	1811	2020	2172
SCE	679	719	1999
SDG&E	614	n.a.	n.a.
SMUD	769	639	982

# Optional Reporting

- Employee travel
- Commuting
- Product use
- Waste transport
- Product Transport
- Product disposal

**Also:**

- \*Other environmental programs
- \*Emissions reduction goals
- \*Emission reduction projects

# Reporting Emissions

# ■ CARROT: Climate Action Registry Reporting Online Tool



- Version 1.0 = Launched October 2002
- Version 2.0 = Released April 18, 2005
- Version 3.0 = beta testing Fall 2006; release Early 2007

# CARROT



- REPORT: Annual inventory must be reported through CARROT
  - Secure, encrypted workspace
  - Each Participant manages their own users:
    - Administrator – all access
    - User – one or more facilities
    - Reviewer – read-only access
    - Certifier – read-only access, submit electronic opinion
- CALCULATE: Many calculations can be done in CARROT
- CERTIFY:
  - Standardizes/lowers certification cost
  - Certifiers view all data once authorized by Participant (after data submitted for certification)
    - Public Users access certified emission reports
- ADMINISTRATION: Registry creates new accounts, accepts data<sup>53</sup>

# CARROT FAQs



- 162 mmt CO<sub>2</sub>e certified (2000-2004)
- 80 reporting entities
  - 62+ 2005 inventories in progress
- >200 users
  
- “CARROT Inside” World Economic Forum’s Global GHG Register

# Key Features for CARROT Version 3.0



- Bulk data transfer & data exchange
- Multi-gas calculation tools
- Industry-specific reporting requirements
  - Power generation, transmission & distribution
  - Forest entities and projects
- Improved reports & analytical tools

# Certifying Emissions



# Certification Overview



- What is Certification?
  - Independent review of reported emissions
- Why is it Important?
  - Ensures reported emissions adhere to the reporting requirements and achieve a minimum quality standard (95% accuracy)
- Who is a Certifier?
  - Accredited by both the State of CA and the Registry as qualified to assess a participant's reported emissions

# Core Certification Activities



1. Identify Emission Sources
  2. Review Management Systems & Methodologies
  3. Verify Emission Estimates
- Certification can be a three-year cycle
    - Where same certifier used for 3 consecutive years, and
    - Where operations/emissions do not change significantly

# Certification Process



1. **Participants:** calculate and report; select certifier
2. **Certifiers:** conduct certification activities
  - COI determination
  - CEC notification
  - Prepare report for participant; opinion for Registry
3. **Registry:** review, accept and store data
4. **State:** oversee certification activities (CEC), and consider data



# Timeline: Certification Process

<b>Reporting</b> Deadline	<b>August 31st</b>
Select Certifier	September (2 weeks)
COI Determination	September (2 weeks)
Finalize contract	October (2 weeks)
Notification of certification activities	October (2 weeks)
Certification Activities	November/December (2-6 weeks)
<b>Certification</b> Deadline	<b>December 31st</b>

# Value of Certification



- External review identifies inconsistencies
  - Better accounting of energy usage
  - Identify energy inefficiencies
- Gold standard in market
- Bears public scrutiny
- Consideration in case of future regulation

# Registry Resources



- Protocols
  - General Reporting/Certification Protocols
  - Cement Protocols
  - Power/Utility Protocols
  - Forestry Protocols
- CARROT User's guide
- Case studies
- Reporting Worksheets
- Certification Prep workshops

[help@climateregistry.org](mailto:help@climateregistry.org)

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