



SANITATION DISTRICTS OF LOS ANGELES COUNTY

Greenhouse Gas Emission Reduction Strategies

CWEA Workshop on Biosolids Issues

**Whittier, CA
January 26, 2010**

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Presentation Roadmap

- Background Information
- AB 32 and Emissions Reduction Strategies in California
 - Emissions Reporting
 - Command and Control
 - Cap and Trade
 - CEQA
- Federal Activities
- What is the Industry Doing?

The Reality of Climate Change



Regulated Greenhouse Gases (GHGs)

1. Carbon Dioxide - CO₂
2. Methane - CH₄
3. Nitrous Oxide - N₂O
4. Sulfur Hexafluoride - SF₆
5. Hydrofluorocarbons - HFCs
6. Perfluorocarbons – PFCs

Global Warming Potential

- Measurement of the heat trapping potential of various GHGs relative to CO₂

GHG	100-yr GWP
CO ₂	1
CH ₄	21
N ₂ O	310
HCFC's	140-11,700
PFC's	6,500 – 9,200
SF ₆	23,900

Source: Intergovernmental Panel on Climate Change, [*Climate Change 2001: The Scientific Basis*](#) (Cambridge, UK: Cambridge University Press, 2001)

Global Warming Potential

- Measurement of the heat trapping potential of various GHGs relative to CO₂

GHG	100-yr GWP
CO ₂	1
CH ₄	21
N ₂ O	310

For example:

- 1 MT of CO₂ produces 1 MT of CO₂e
- 1 MT of methane produces 21 MT of CO₂e
- 1 MT of N₂O produces 310 MT of CO₂e

When is a Greenhouse Gas Emission Not an Emission?

- The classic example of Anthropogenic emissions is the combustion of fossil fuels. These activities add NEW CO₂ (and other GHGs) to the atmosphere.
- Biogenic CO₂ emissions recycle CO₂ already in the air.
- Successfully captured and combusted digester gas and landfill gas are considered biogenic. These fuels are considered “carbon-neutral.”
- CO₂ from aeration tanks and offgasing from biosolids piles or composting is also in the short-term C cycle.
- **Methane** and **Nitrous Oxide** are outside of the short-term C cycle and, for man’s activities, are ALWAYS considered ANTHROPOGENIC

More about the Short-Term Carbon Cycle

- This process essentially mimics the closed loop of the natural carbon cycle, i.e., returns to the atmosphere what was originally removed by photosynthesis
- IPCC Guidelines for National Greenhouse Gas Inventories (2006) states that carbon dioxide emissions from wastewater are not considered because they are of biogenic origin (Volume 5, page 6.6).

Mandatory Reporting for California

- Many features similar to the voluntary program by CCAR
- Most would report to the ARB by April 1, 2010
- Reporting Thresholds:
 - > 25,000 mtpy general stationary combustion
 - > 10,000 mtpy CHP
 - > 1MW capacity AND > 2,500 mtpy electrical generation
- At the last minute, ARB pulled the exemption for biogenic emissions of CO₂ from triggering the reporting threshold.
- Reports must be certified by a third-party verifier

Mandatory Reporting for California

- Entities report by facility stationary combustion emissions and electricity use
- “Biogenic” CO₂ emissions reported as Scope 3 (separate from fossil fuel and electricity)
- What does it take to exceed the thresholds?
 - 460 MM ft³ of natural gas will yield 25,000 mt of CO₂
 - 184 MM ft³ of natural gas will yield 10,000 mt of CO₂
 - 46 MM ft³ of natural gas will yield 2,500 mt of CO₂
 - A 50 MM BTU/hr Boiler Operating 24/7/365 at full load will exceed the general stationary combustion threshold.

Mandatory Reporting for EPA

- Threshold of 25,000 mtpy CO₂ eq. if sum of stationary combustion sources exceeds 30 MM BTU/hr
- Biogenic emissions exempt from threshold determination but have to report if fossil fuel emissions exceed threshold
- POTWs NOT included in categorical reporters because of low emissions
- Stationary source combustion to be reported
- Does not preempt state programs
- EPA verification of self-certified reports

AB 32 California's GHG Law

- 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)
 - Scoping Plan is the blueprint for how the State will achieve the necessary reductions

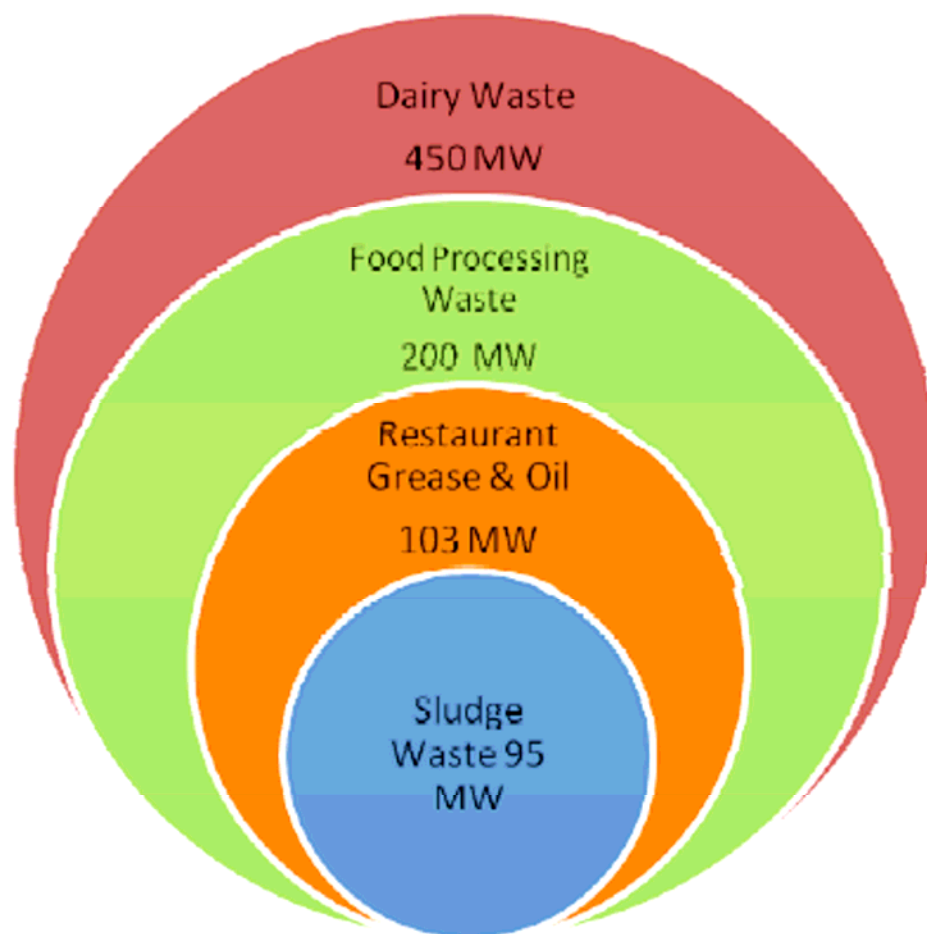
How to Reduce Emissions

- **Command and Control Approaches**
 - Categorical emission reduction mandates enforceable through permits, inspections
- **Efficiency Standards**
- **Voluntary Efforts**
- **Planning Strategies**
- **Public Information – Lower Profile**
- **Market Strategies**
 - Cap and Trade
 - Carbon Taxes

Command and Control Approaches

- Renewable Portfolio Standard – 20% by 2010 and 33% by 2020 (executive order)
 - 4,000 Megawatts of New, Renewable Combined Heat and Power (CHP)
- Up to 450 MW of Potential CHP from Digesters at POTWs
 - Current CHP is 35 MW
 - Existing potential is 125 MW with on-site improvements
 - Potential to 450 MW by accepting non-traditional wastes

Figure 2: Expanding Market Potential for Wastewater Treatment Plant CHP Through Sludge Co-Digestion of Multiple Bio-waste Streams in California



Source: *Co-digestion of Dairy Manure/Food Processing Waste and BioSolids/Food Processing Wastes to Energy*, California Energy Commission Report, 500-2007-015. March 2008.

Command and Control Approaches

Regulatory Barriers to CHP Expansion at POTWs

- Increasing Digester Gas Combustion Would Increase Criteria and GHG Production at POTWs
 - Shifting emissions out of one sector over to POTWs
 - Title V
 - CAA Non-Attainment Fees
 - Emission Fees
 - CEQA Thresholds and GHG Requirements
 - Criteria Pollutant Credits are Expensive
- If POTWs are captured under Cap and Trade, Offsets could NOT be generated from this activity
- Increase the Biosolids throughput of the facility

AB 32 Cap and Trade

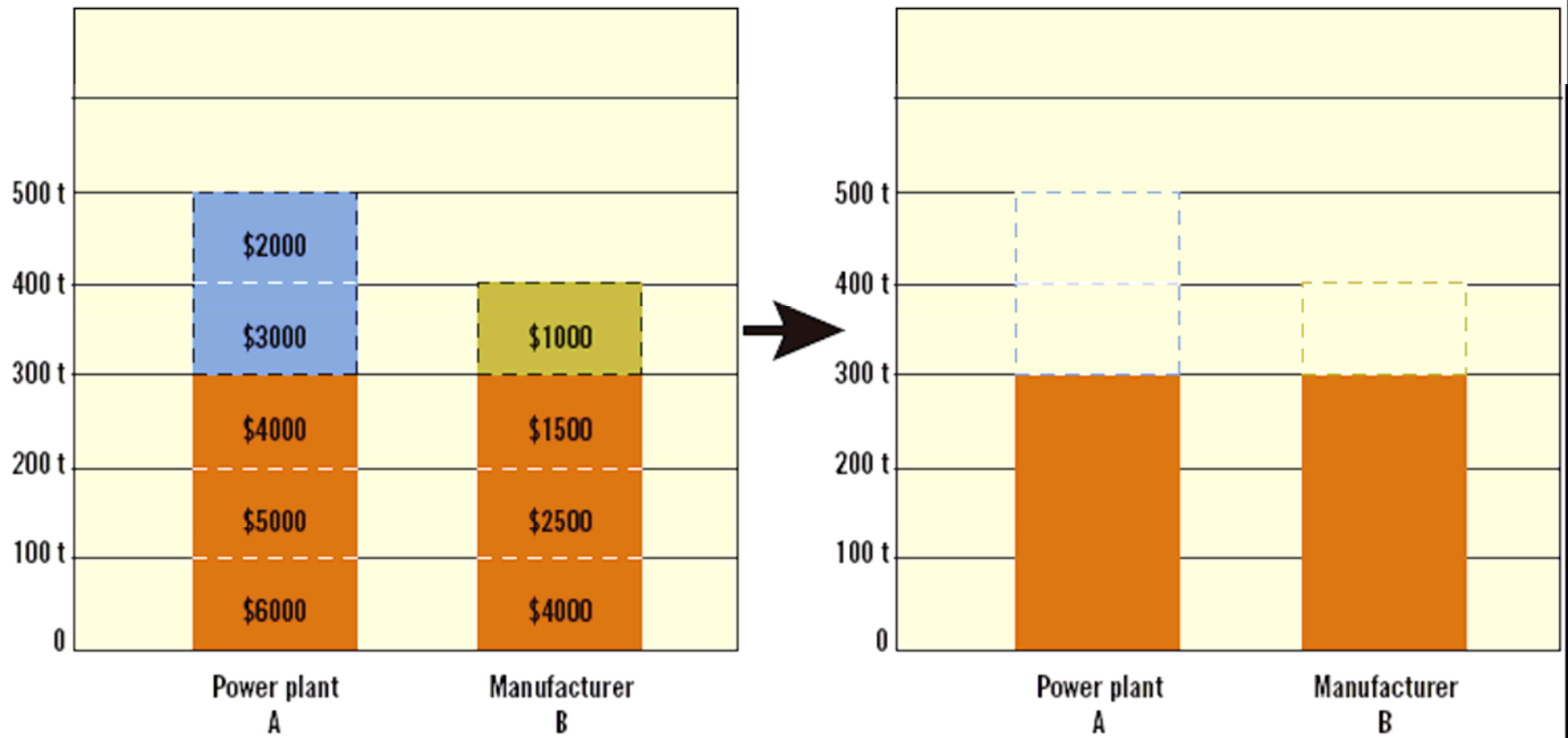
- Preliminary Draft rolled out November 24, 2009, covers roughly 85% of the state's GHG emissions
- Still under discussion, but POTWs are not categorically included, but an individual POTW with anthropogenic emissions > 25,000 mtpy would be in.
- Trading begins 2012 – Electrical generators and stationary source combustion starts first (>25,000 mtpy).
- In 2015, stationary combustion >10,000 mtpy are included as are transportation fuels
- Significant penalties for failing to surrender allowances sufficient to cover the emissions at the end of the compliance period.

Allowance Fundamentals

- Allowances are government-issued authorizations to emit 1 MT CO₂ eq.
- Allowances distributed/made available = size of the cap FOR THAT YEAR
- Allowances must be surrendered if emissions occur
- Allowances can be distributed freely or auctioned or both
- Allowances can be given to non-regulated entities
- “Covered Sectors” in a cap and trade program CANNOT generate Offsets

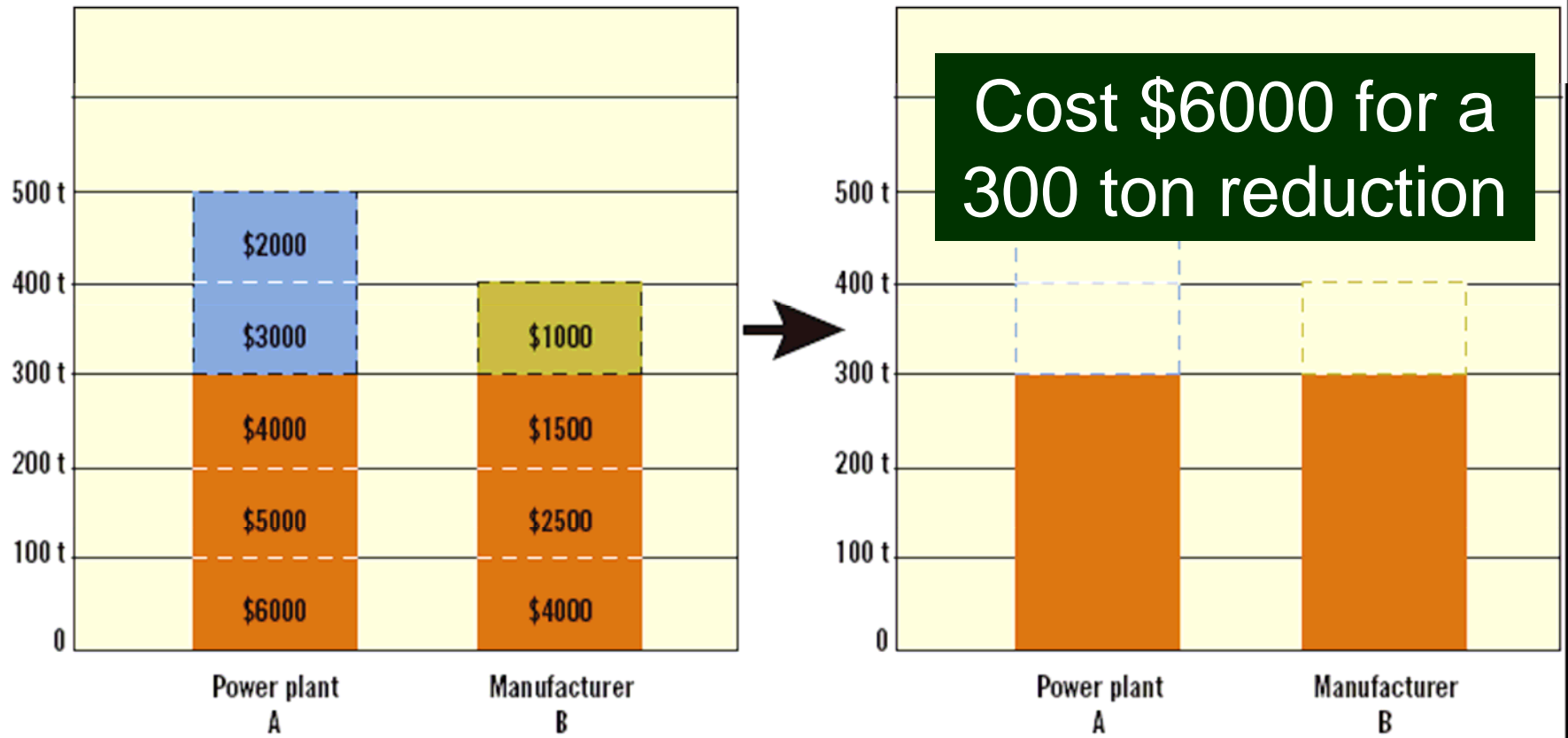
Example of Cap and Trade Fundamentals

Command and Control



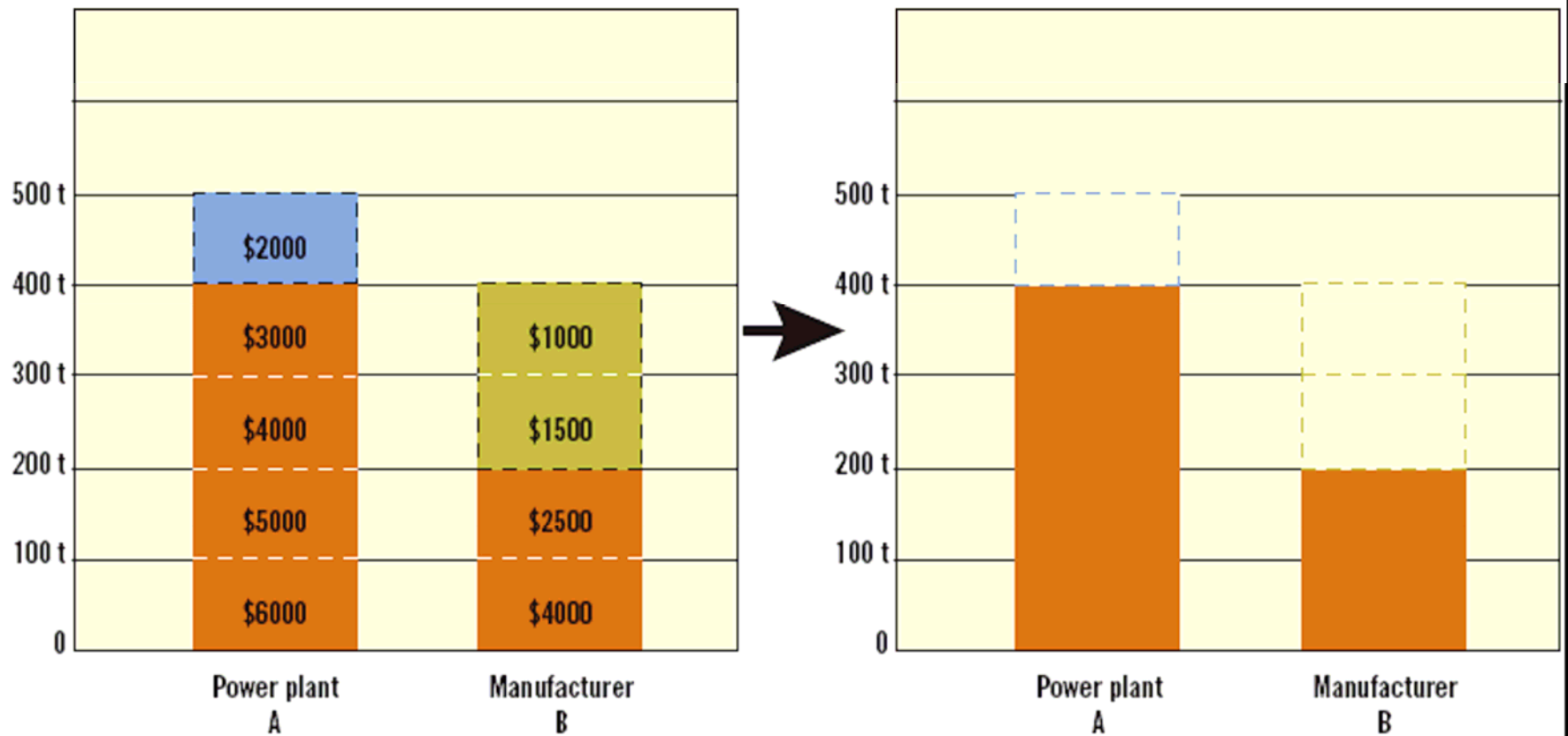
Example of Cap and Trade Fundamentals

Command and Control



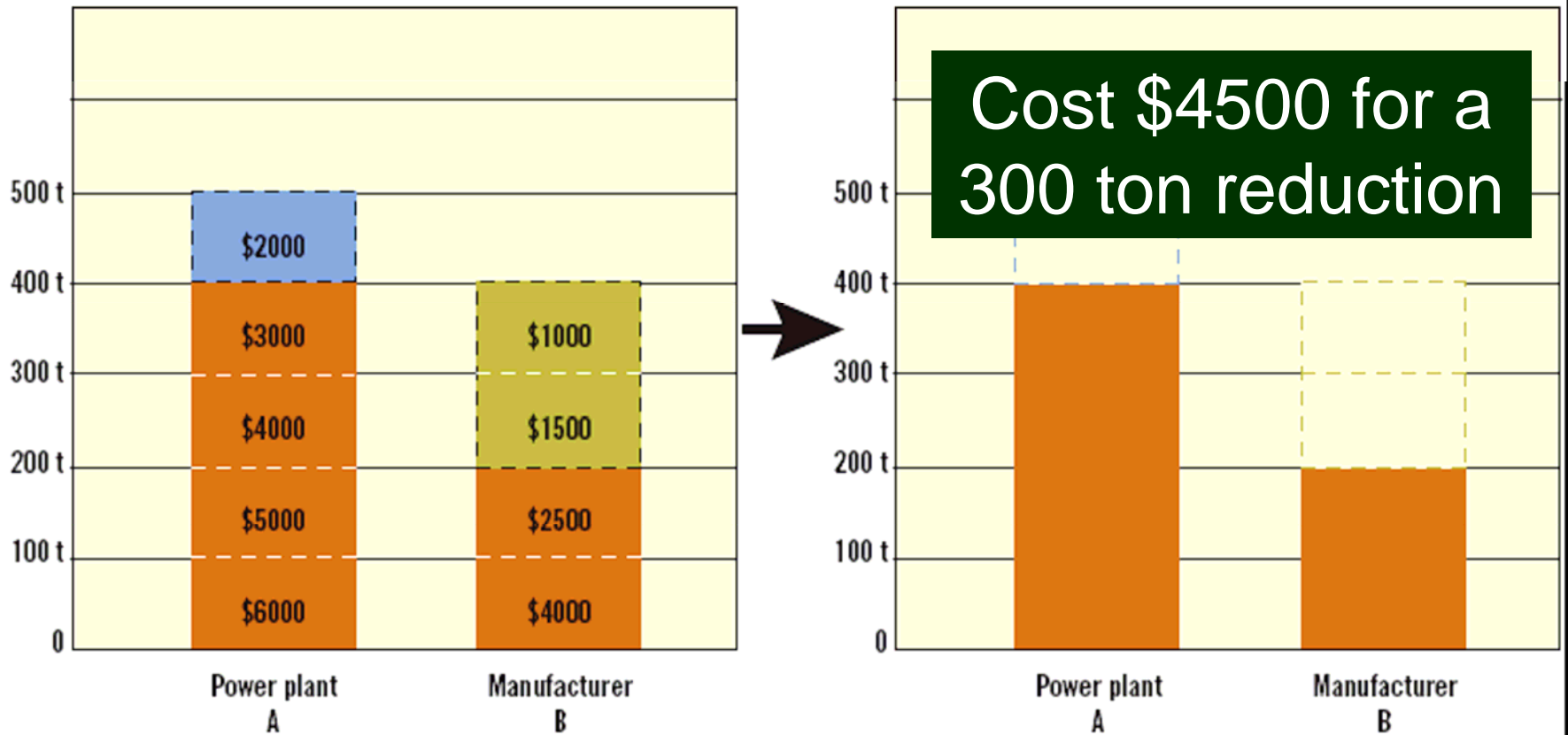
Example of Cap and Trade Fundamentals

Cap and Trade



Example of Cap and Trade Fundamentals

Cap and Trade



Additionality and Offsets

- Offsets cannot be generated by covered sectors in Cap and Trade
- Offsets limited to less than half of the reduction
- Offsets must be:
 - Real
 - Verifiable
 - Permanent
 - Enforceable
 - Additional
- Additionality refers to emission reductions not required by law or regulation nor would otherwise have occurred.
- Offsets must follow protocols approved by regulatory bodies

POTWs in Cap and Trade

- CWCCG has argued that POTWs should **NOT** be in Cap and Trade because:
 - Essential public services like POTWs should be insulated from market uncertainties
 - Unfair to pit essential public services against for-profit operations that can move to maximize market opportunities
 - Limited ability to curtail their operations because of their public safety mandates
 - Potential to generate Offsets would be erased

CEQA and Greenhouse Gases

- Motivation to pass SB 97 in part because of the Attorney General's legal challenges
- SB 97 directed OPR to develop CEQA Guidelines that included GHG considerations
- The Amended Guidelines were adopted by the Natural Resources Agency very late in December, 2009
 - Allowed Lead Agencies to pick their own threshold
 - Threshold must be supported by substantial evidence
 - Lead agencies should quantify GHG emissions for their projects
 - Lead agencies should consider all feasible mitigation measures
 - No numeric threshold established in the Guidelines – lead agencies can use one approved by another air regulatory agency

CEQA and Greenhouse Gases

- Patchwork of GHG thresholds developing within the individual air districts
- Using a “bright-line” threshold for stationary sources:
 - SCAQMD
 - BAAQMD
- Using a “best performance standard” (BACT-like) approach:
 - SJVAPCD
 - Technology compared to a District-approved “Best Performance Standard”
 - If BPS not used, project would have to reduce emissions by 29% from its “business as usual” projection for 2020
- SCAQMD and SJVAPCD have local GHG credit markets for the purpose of CEQA mitigations

Federal Legislation/Regulation/Adjudication

- Massachusetts v. EPA Supreme Court Ruling
- EPA Endangerment Finding
- EPA's Proposed GHG "Tailoring" Rule
- Murkowski Resolution to Nullify Greenhouse Gas Endangerment Finding

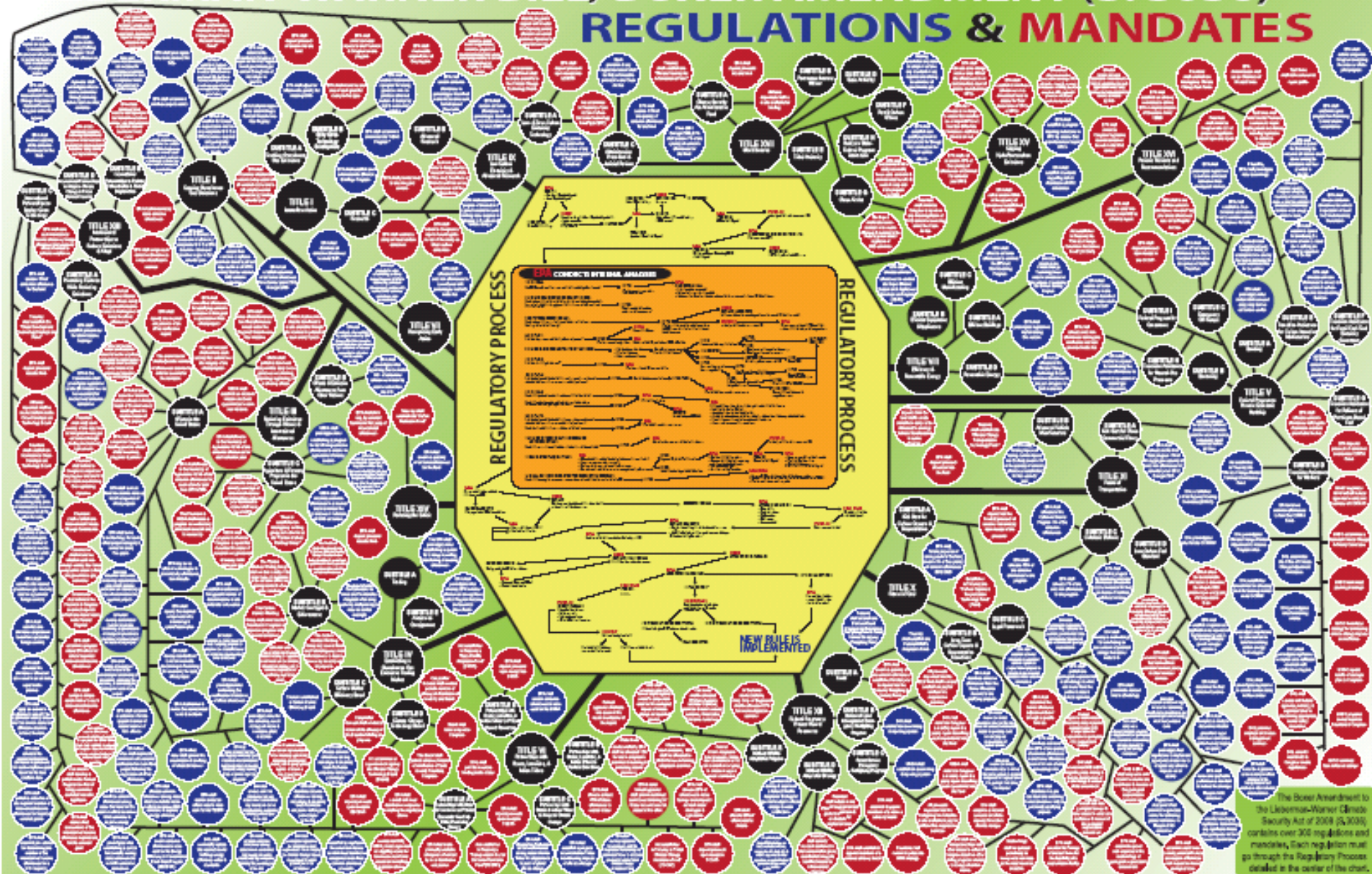
Federal Legislation

- Kerry/Graham/Lieberman – Resurrect GHG Legislation in the Senate
- Bingaman Energy Bill
- Waxman/Markey - H.R. 2454

What Are Typically in GHG Bills?

LIEBERMAN-WARNER BILL, BOXER AMENDMENT (S. 3036)

REGULATIONS & MANDATES



The Boxer Amendment to the Lieberman-Warner Climate Security Act of 2009 (S. 3036) contains over 300 regulations and mandates. Each regulation must go through the Regulatory Process detailed in the center of the chart.

What is Being Done?

- **NACWA efforts**

- Review and comment on EPA Inventories and Protocol
- Investigate US-specific conversion and loading Factors
- Issued a DRAFT White Paper on emissions
- First effort targeted nitrogen loading to POTWs
- Suggest that Biosolids should be included in the definition of “Biomass” in Federal Legislation/Regulation

What is Being Done?

- **CWCCG**

- Submitted Comment Letters On:
 - CEQA Thresholds
 - EPA Tailoring Rule
 - California Cap and Trade
 - Federal Mandatory Reporting
 - Renewable Electricity Standard
- Worked with the CCAR staff to weigh-in on their Local Government Protocol and Tracking Other Protocols by the TCR
- Suggest that POTWs and Biosolids operations should be kept OUT of Cap and Trade.

What is Being Done?

● WERF

- Nitrous oxide emissions from nutrient removal plants
- Microbial fuel cells
- White Paper to characterize climate change impacts to the wastewater utility industry
- Best practices study at the 100% energy self-sustainable wastewater treatment plant in Strass, Austria
- Wastewater industry emissions inventory and verification handbook

● WEF

- Technical Sessions at WEFTEC
- Board Position Statement supports research and GHG reductions
- WEFTEC '08 Workshop with AAEE support
- Climate change to be worked into Sustainability Specialty Conference with accompanying workshop
- MOP 8 and Solids Processing Design Manual to include greenhouse gas mitigation measures

What is Being Done?

- **NBP Webinar on Emissions from Biosolids Options – 1/27/2010**
 - <http://wordpress.cwea.org/?cat=52>
- **BEAM Emissions Calculator**
 - http://www.ccme.ca/ourwork/waste.html?category_id=137

AB 32 Links:

ARB – Cap and Trade:

<http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

ARB Mandatory Reporting:

<http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm>

Public Access to GHG Emissions by Facility:

<http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-reports.htm>

ARB – Renewable Electricity Standard:

<http://www.arb.ca.gov/energy/res/res.htm>

ARB Low Carbon Fuel Standard:

<http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>

CEQA Links:

ARB:

<http://www.arb.ca.gov/cc/localgov/ceqa/ceqa.htm>

Resources Agency:

<http://ceres.ca.gov/ceqa/guidelines/>

SJVAPCD:

http://www.valleyair.org/Programs/CCAP/CCAP_idx.htm

BAAQMD:

<http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES.aspx>

SCAQMD:

<http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html>

EPA Links:

EPA – GHG Tailoring Rule:

<http://www.epa.gov/EPA-AIR/2009/October/Day-27/a24163.htm>

EPA - Mandatory Reporting:

<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>

EPA – National Greenhouse Gas Inventory:

<http://www.epa.gov/climatechange/emissions/usinventoryreport.html>

And Climate Action Reserve...

<http://www.climateactionreserve.org/how/protocols/in-progress/composting/>

Industry and Other Links:

SCAP – Air Committee:

http://www.scap1.org/Air%20Reference%20Library/Forms/ndx_AllDocuments.aspx

CASA/CWCCG:

<http://www.casaweb.org/?q=node/34>

SCAP – Energy Committee:

http://www.scap1.org/POTW%20Reference%20Library/Forms/ndx_AllDocuments.aspx

About the Debate:

<http://climatedebatedaily.com/>

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