NOVEMBER 20, 2013 – BACWA AIR COMMITTEE MEETING

Greenhouse Gas Regulations and the Wastewater Community

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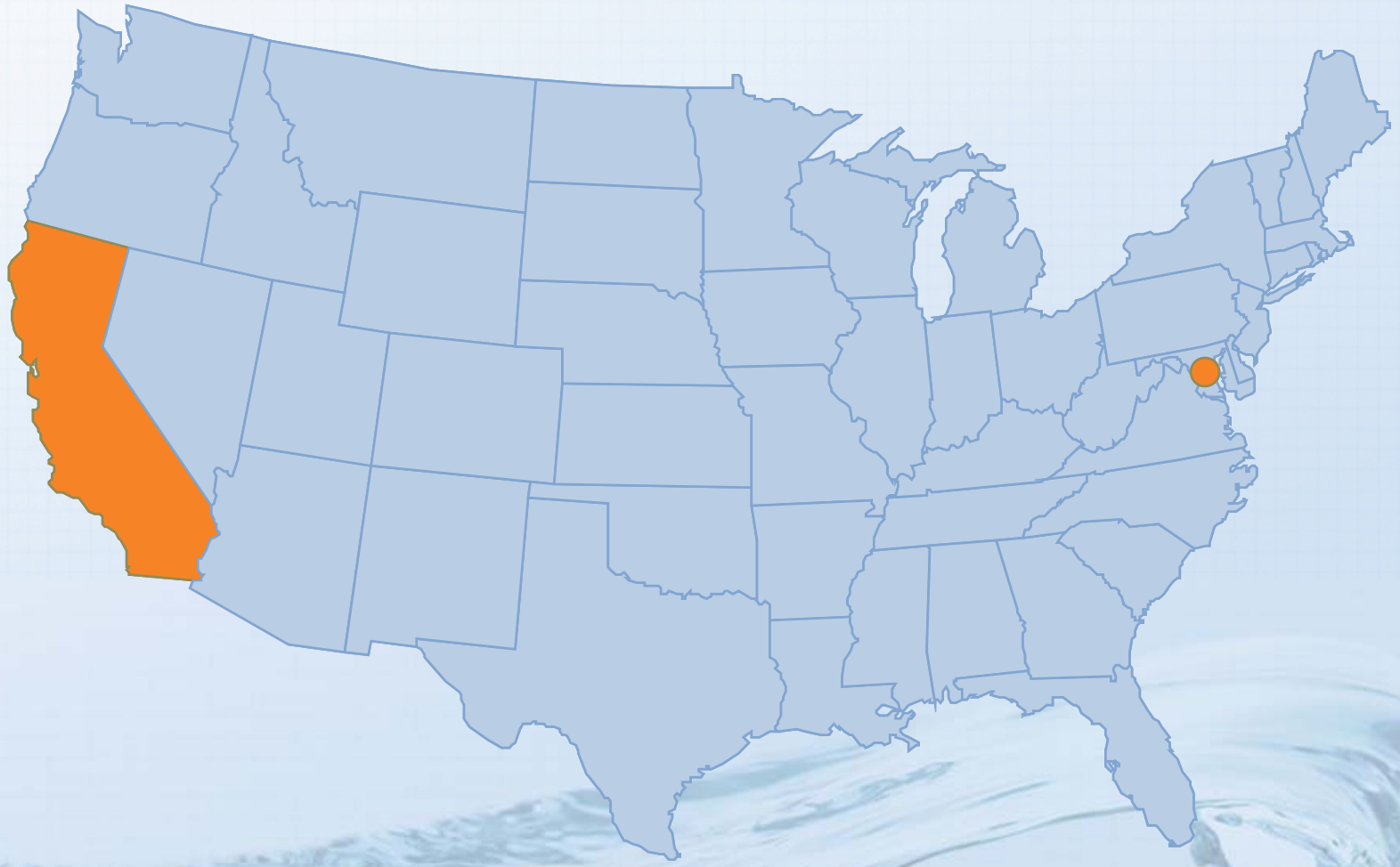
Engineers...Working Wonders With Water®

Both State and Federal GHG (air and energy) related regulations are driving POTW decisions



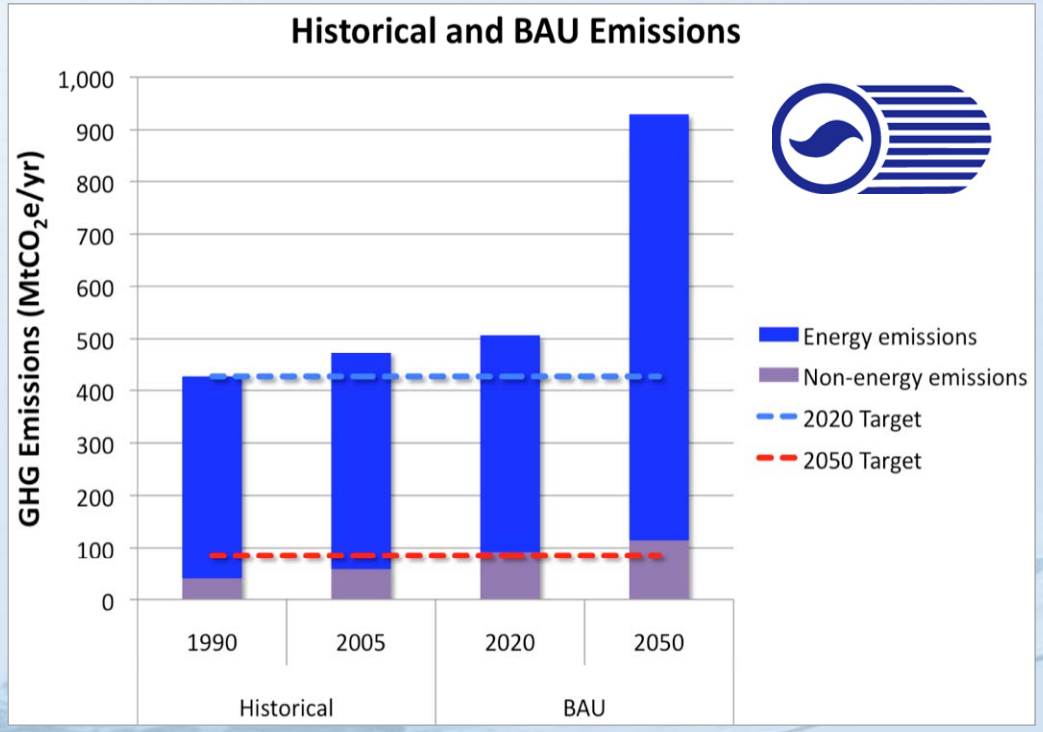
Regulations having the largest potential influence on POTW operations include…

	California	Federal
Air	• AB 32, Global Warming Solutions Act • SCAQMD Rule 1110.2, Emissions from Gaseous- and Liquid-fueled Engines	• EPA Prevention of Significant Deterioration and Title V GHG Tailoring Rule • EPA Greenhouse Gas Mandatory Reporting Rule
Energy	• SB 1122, Bioenergy Projects • AB 1900, Biomethane	
Solids	• AB 341, Waste Diversion	

State Regulations: AB 32

Air: AB 32 requires some POTWs to report GHGs, but may provide opportunities for bioenergy projects

- First Act in U.S. regulating GHGs
- Enforced by the California Air Resources Board
- Sets targets for future statewide GHG emissions levels:
  - 2020: 1990 levels
  - 2050: 80% below 1990 levels

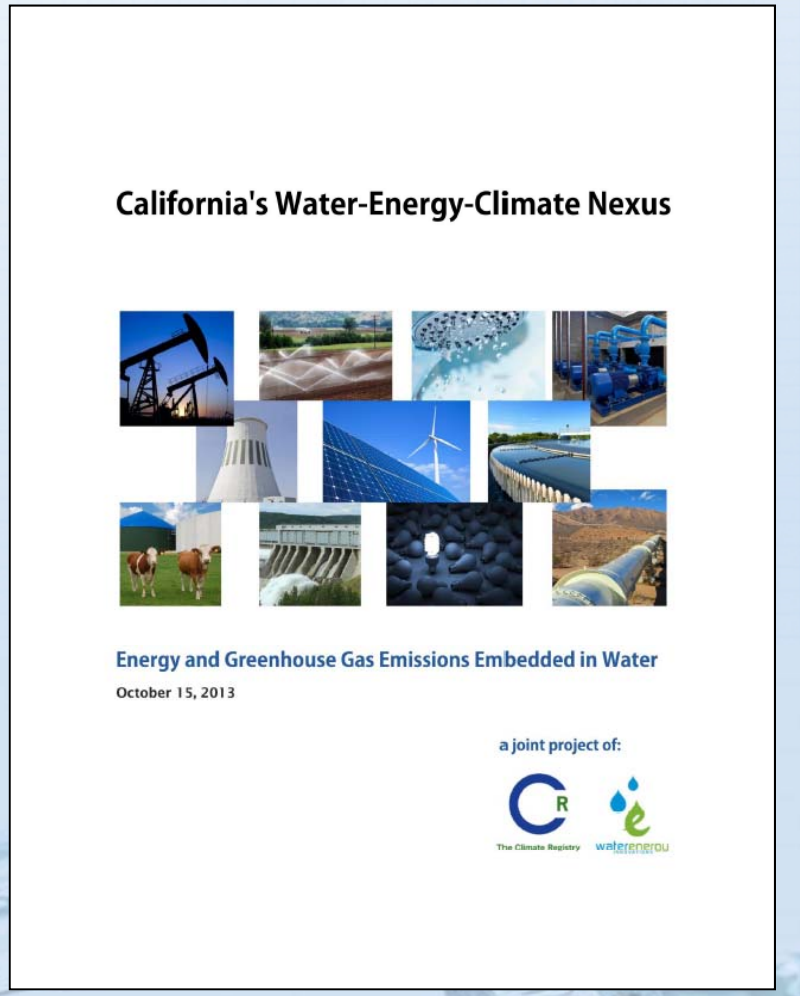


CWCCG worked with ARB staff during the 2013 MRR update to get an exclusion

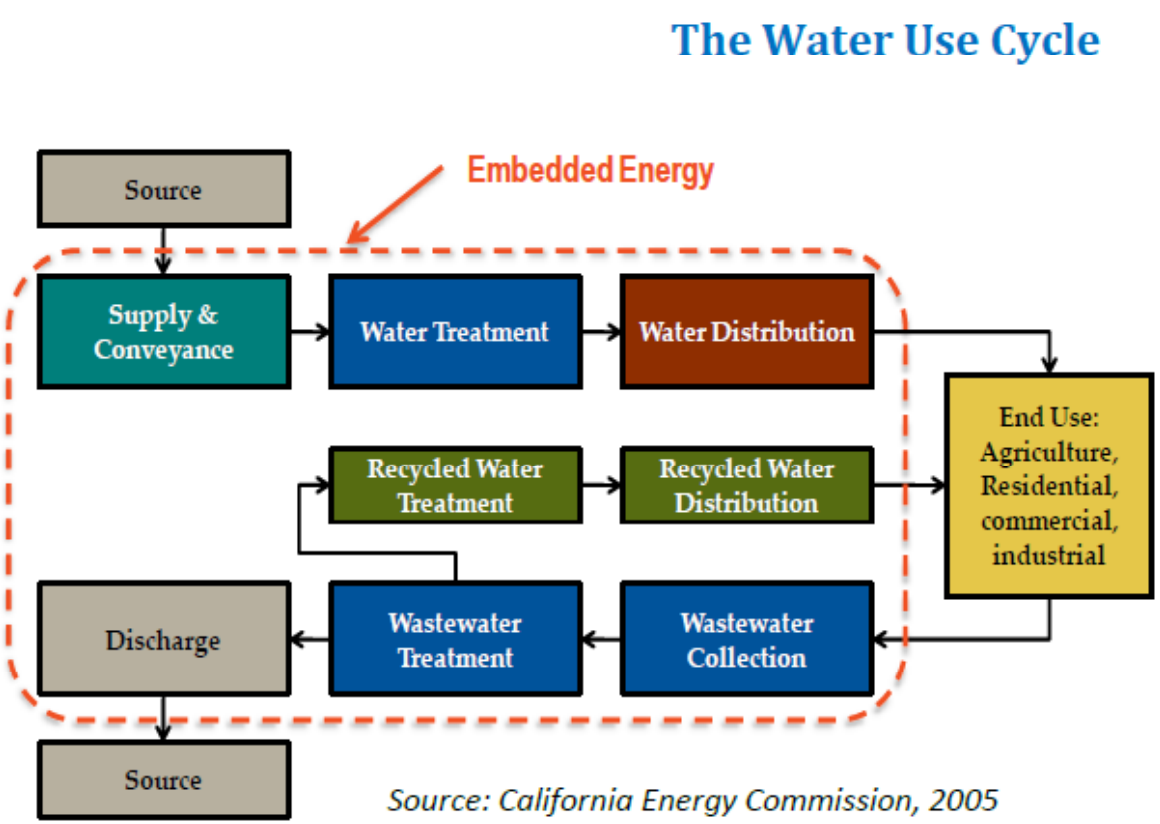
- Revised MRR, 95101(b)(2), Pg 2, reads:
  - "…if emissions captured within the…facility boundary, **including vented and fugitive emissions**, exceed the 25,000 metric ton CO_2e threshold…must submit a GHG report pursuant to the full requirements…"
    - Met with ARB staff to discuss excluding WWTPs
    - ARB attorney's reviewed regulation
    - Submitted comment letters to ARB to exclude fugitive and process CH_4 and N_2O emissions
  - ARB to document that municipal WWTPs do not have to report fugitive and process emissions in Final Statement of Reasons for the MRR and may insert exclusion into the Cap & Trade regulation

However, The Climate Registry and Water Energy Innovations are urging ARB to account for embedded energy in water

- Released October 15, 2013
- Effort to standardize accounting and reporting of energy and GHGs embedded in the State's water systems and supplies
- Intent is to be a benchmark for:
  - meeting the goals and objectives of public programs
  - Complying with regulatory requirements that govern allocation of public funds



The water use cycle developed by CEC in 2005 that TCR and WEI reference

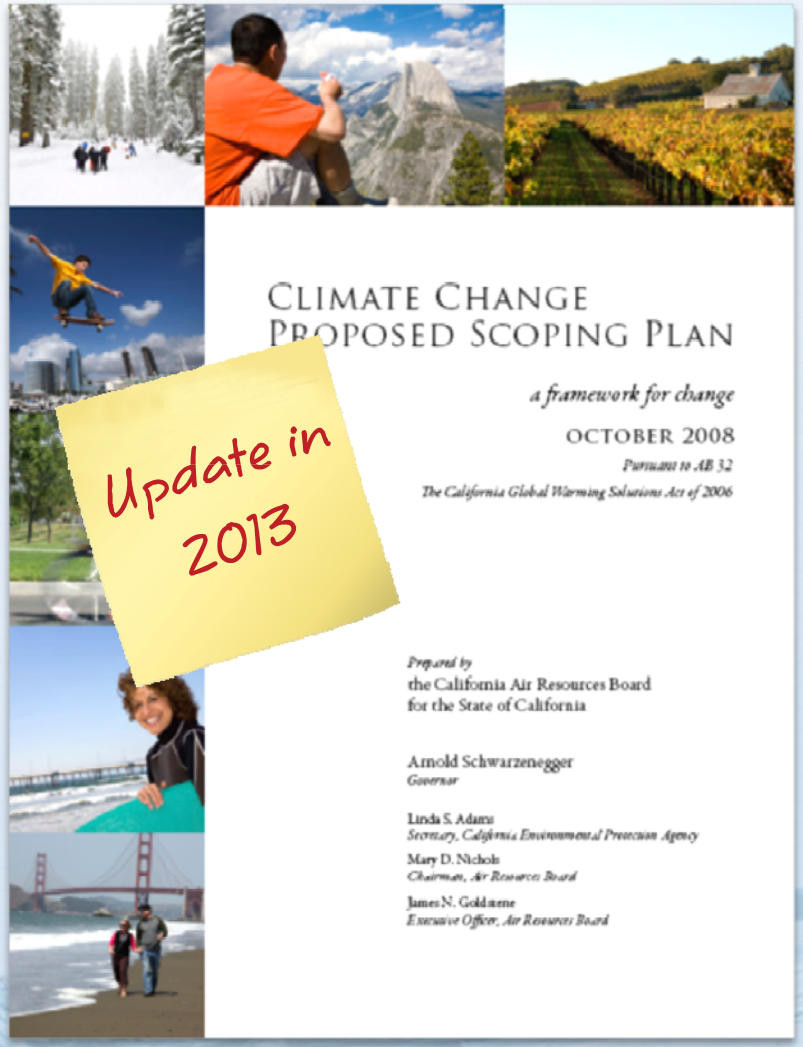


Energy embedded in water is the sum of energy input into water along the various segments of the water use cycle: from point of collection or production, through to point of use; and from wastewater collection, treatment, and ultimate disposal or reuse.

The amount of energy that can be saved by saving water is thus the sum of all energy inputs along the water use cycle by multiple water and wastewater agencies, plus the amount of energy input by water customers during their consumption, use or reuse of water.

The boundary of this analysis is beyond the scope of emissions required by AB 32

The Scoping Plan lays out the approach for satisfying future GHG reduction targets…



- First update since 2008
- October 1: Discussion Draft
- November 25: Final Proposed Update and appendices to be released for review and comment
- Mid-December: Board Update
- April 2014: Board Hearing to Consider Final Updated Scoping Plan

Key elements to achieve statewide GHG reduction targets in Scoping Plan include…

- Vehicle reductions
  - Low carbon fuel standard
  - Raise average fuel economy
- Renewable portfolio standard of 33% by 2020
- Cap-and-Trade Program
- Energy efficiency
- Enforce existing regulations

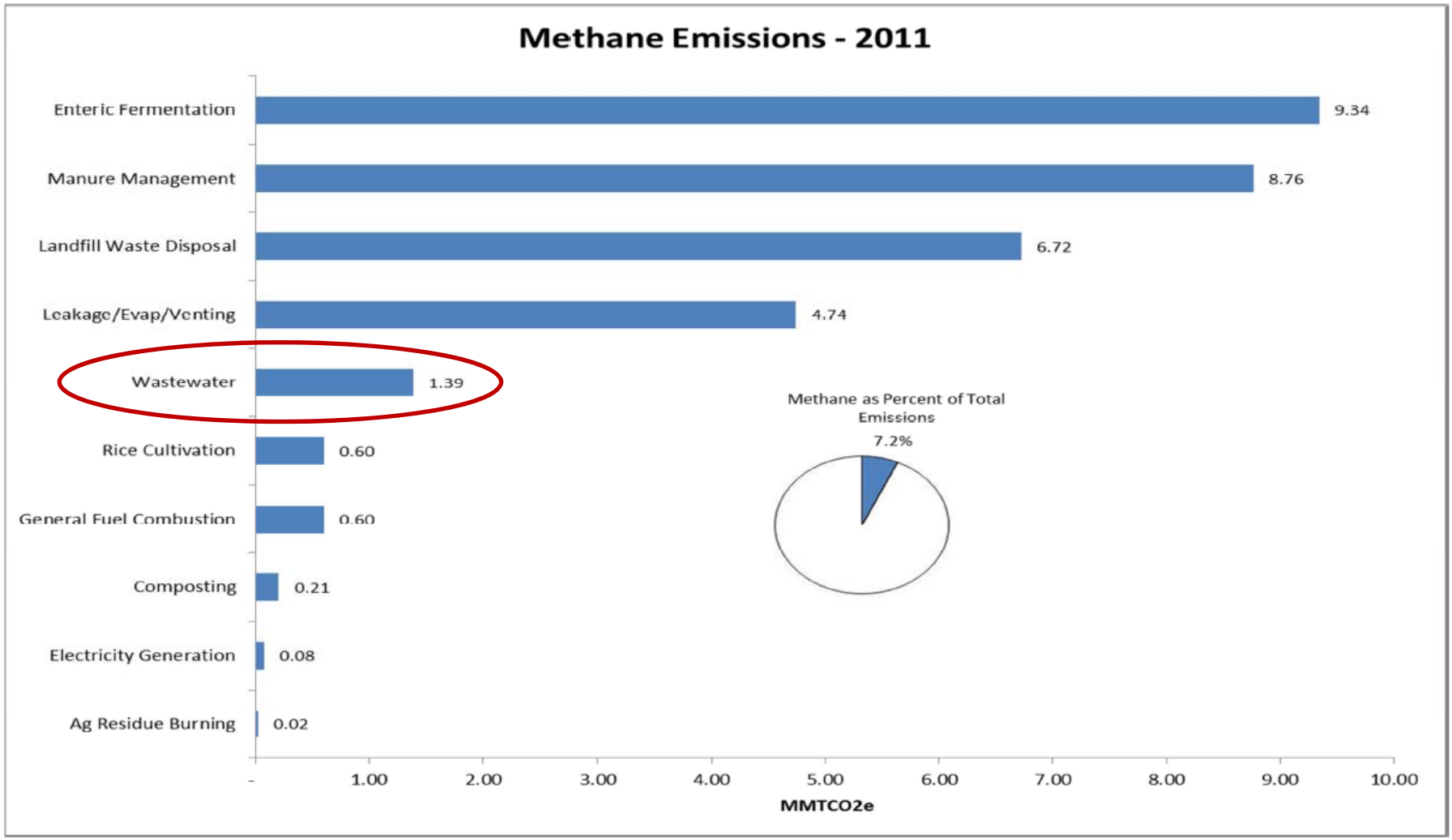
25% of cap-and-trade proceeds to benefit disadvantaged communities

However, the Scoping Plan Update does not specify opportunities for POTWs

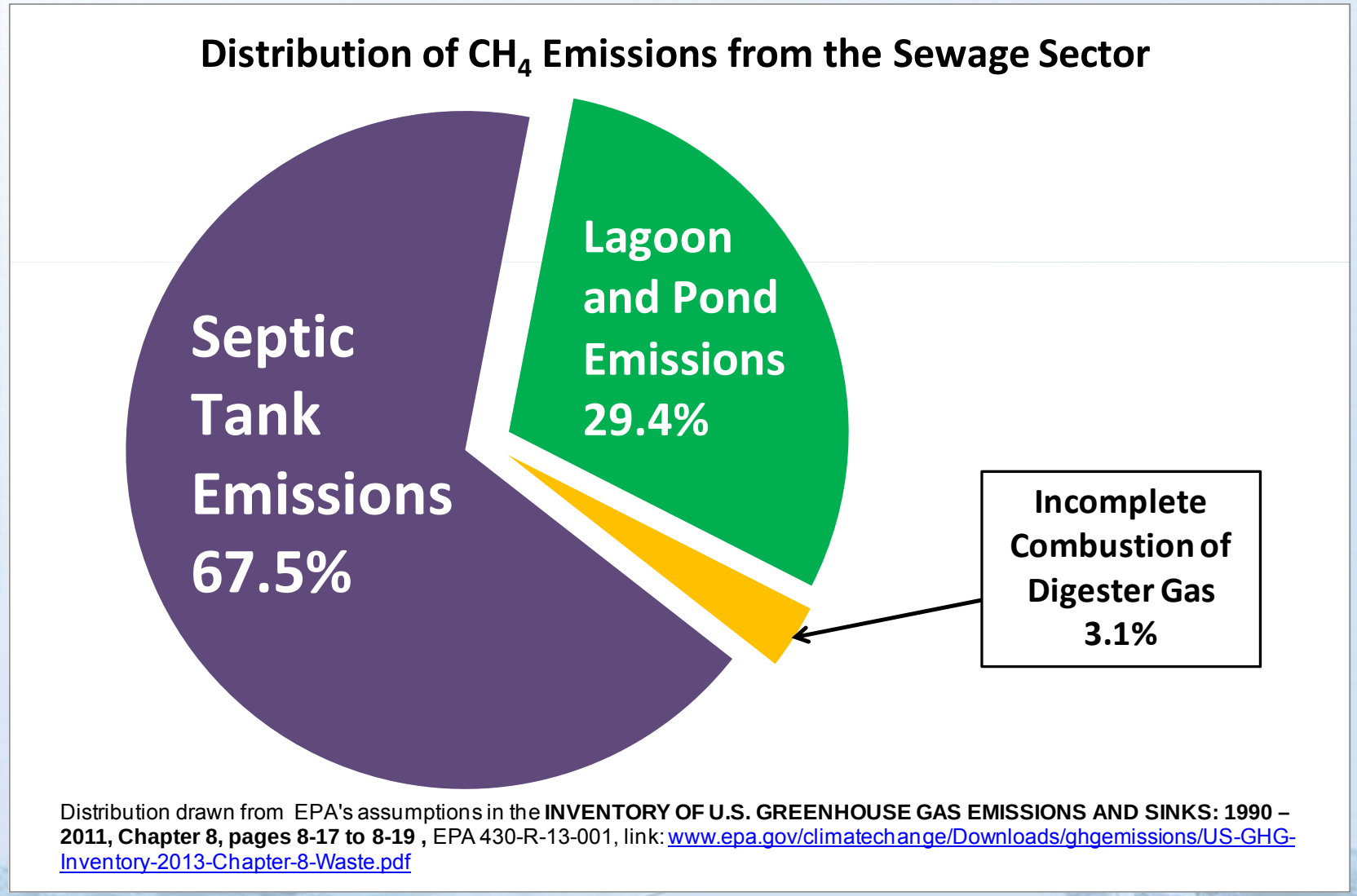
- Progress toward meeting 2020 goals with no backup data (appendix unavailable until “proposed draft” released)
- Six focus areas for setting long term (2050) goals: transportation, energy, water, waste management, agriculture, and natural and working lands
  - Intention to set an interim 2030 target
- Transition to GWPs from IPCC Fourth Assessment Report (CH_4: 21 to 25 and N_2O: 310 to 298)
- Water sector includes groundwater and surface water resources, the infrastructure for its storage, conveyance, use, treatment, and recycling from these sources

“Wastewater Treatment” one of the top five anthropogenic sources of CH_4 in 2011

Figure 3: California Methane Emission Sources (2011)



CWCCG provided data showing "wastewater treatment" is not source of anthropogenic CH_4



Distribution drawn from EPA's assumptions in the **INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990 – 2011, Chapter 8, pages 8-17 to 8-19 ,** EPA 430-R-13-001, link: www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Chapter-8-Waste.pdf

CWCCG is waiting for the Proposed Draft and relevant appendices due out November 25

- We are looking for more detail and specific opportunities to be identified in the appendices per our comments submitted on the Kickoff presentation and Discussion Draft
  - Appendix C: Status of Scoping Plan Measures
  - Appendix D: Focus Group White Papers (including the Water focus area paper)

Other State Regulations

Air: Emissions from Gaseous- and Liquid-fueled Engines

South Coast Air Quality Management District – Rule 1110.2

- Purpose: Reduce Oxides of Nitrogen (NOx), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO) from all stationary and portable engines over 50 rated brake horsepower (bhp)
- Key issue for POTWs: NOx limits are so low and expensive to meet, they make flaring (wasting) biogas a competitive (more reliable and compliant) alternative

Energy: Bioenergy Projects and Biomethane

SB 1122 – Bioenergy Projects

- Purpose: To direct electrical corporations to procure ≥250 MW of generating capacity from bioenergy projects (110 MW to come from "new" urban waste or wastewater digesters)
- Key issue for POTWs: Need existing digester capacity to be eligible

AB 1900 - Biomethane

- Purpose: Requires the California Public Utilities Commission (CPUC) to develop standards for constituents in biogas to protect human health and pipeline integrity and safety
- Key issues for POTWs:
  - Pipeline Integrity
  - Costs
  - Health Impacts

Solids: Waste Diversion from Landfills

AB 341 – Solid waste diversion

- Purpose: Requires 75% of solid waste generated to be source reduced, recycled, or composted by the year 2020, with a report to the Legislature providing strategies to achieve this policy goal by January 1, 2014.
- Key issue for POTWs: Existing digester capacity needs to be considered as an immediate option for diversion (as well as the co-benefits of beneficially using the digestate and biogas generated)

Federal Regulations

Federal GHG emission regulations were adopted and in effect in 2011

EPA Prevention of Significant Deterioration and Title V GHG Tailoring Rule

- Purpose: Defines when permits under New Source Review are required for new and existing industrial facilities
  - Biogenic CO_2 emissions may count toward the threshold for inclusion
- Key issues for POTWs: If biogenic CO_2 is included…
  - Could be forced to obtain permits based only on potential-to-emit GHG emissions
  - Demonstrate use of best practices and technologies to minimize GHG emissions
  - Have to report all other air pollutants covered by the permit

Federal GHG emission regulations were adopted and in effect in 2011

- **Court Ruled to vacate EPA "Deferral Rule" for biogenic CO_2 emissions under GHG Tailoring Rule**
  - Vacated on grounds that EPA failed to justify the need for it, but vacature has not been affirmed
  - Appeal received August 26th from anonymous entity
  - Supreme Court to decide whether to hear the appeal after a decision has been on another GHG permit issue
  - NACWA formed a Biogenic Emissions Coalition to discuss their next steps

Federal GHG emission regulations were adopted and in effect in 2011

- EPA Mandatory GHG Reporting Rule
  - Facilities with fossil fuel onsite stationary combustion emissions ≥25,000 metric tons of CO_2e must submit reports
  - Most POTWs are not required to report at this time
  - Plans to update global warming potentials (GWPs) and apply retroactively to reporting years 2010 to 2012:
    - Methane: **21 to 25**
    - Nitrous Oxide: 310 to 298
  - No nationally mandated GHG emissions reduction target
- Key issues for POTWs: If GWPs are applied retroactively,
  - Could trigger regulatory requirements (reporting) and possibly enforcement action
  - Will increase costs of current and future GWP updates

Opportunities for POTWs

CA's wastewater community can contribute toward most of the State's 2020 targets…

- Reducing carbon dioxide equivalent emissions to 1990 levels (AB 32)
- Reducing the carbon intensity of transportation fuel used in the State by 10 percent (AB 32)
- Providing 33 percent of the State's energy needs from renewable sources (AB 32)
- Recycling 75 percent of the solid waste generated in the State (AB 32 and AB 341)

POTWs can contribute toward meeting each of these statewide targets…

- "Wastewater to Energy" projects
  - Biogas to energy
  - Biogas to transportation fuel (biofuel)

↓ GHG reduction

↑ renewable energy production

↑ low carbon fuel

- "GHG offset" projects - land application of digestate/biosolids
  - Store carbon
  - Displace synthetic fertilizer

↓ GHG reduction

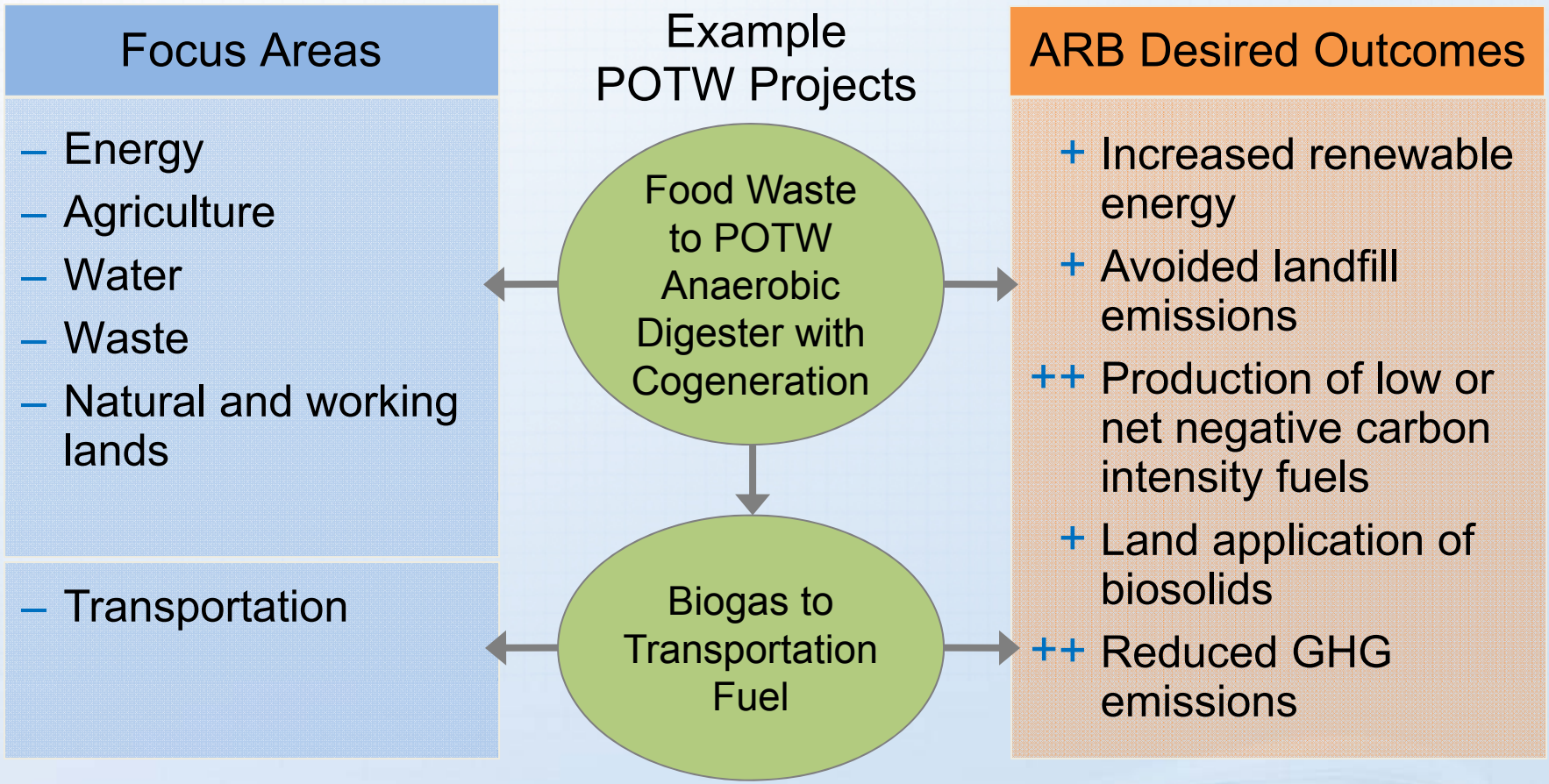
- Increase soil's carbon retention with digestate vs. synthetic fertilizer
- Replacing energy-intensive synthetic fertilizer

For 2050 reduction targets, ARB is using 6 focus areas for laying the groundwork

- Focus Areas
  - Energy (generation, transmission, and efficiency)
  - Transportation (fuels, infrastructure, and land use)
  - Agriculture
  - Water
  - Waste
  - Natural and Working Lands

- ARB desired outcomes
  - Reduced GHG emissions
  - Increased renewable and local source of energy
  - Avoided landfill emissions from decomposition of food waste
  - Production of low or net negative carbon intensity fuels
  - Land application of biosolids to avoid use of synthetic fertilizer and sequester carbon in the soil (also preventing soil erosion and reducing fire hazard)

POTW projects can contribute toward multiple focus areas and ARB goals… simultaneously!


Focus Areas
– Energy
– Agriculture
– Water
– Waste
– Natural and working lands
– Transportation
Example POTW Projects
Food Waste to POTW Anaerobic Digester with Cogeneration
Biogas to Transportation Fuel
ARB Desired Outcomes
+ Increased renewable energy
+ Avoided landfill emissions
++ Production of low or net negative carbon intensity fuels
+ Land application of biosolids
++ Reduced GHG emissions

CWCCG/Energy Workgroup talking with Oberon Fuels about potential for biogas to transportation fuel production

- Startup company partnered with Volvo Trucks of North America and Safeway, Inc.
- Producing an alternative to diesel from natural gas and biogas – dimethyl ether – for use in heavy duty trucks
- Interested in POTW biogas and its availability
- Estimate ~2.1 MMSCF needed daily to make it feasible – equivalent to 100+ MGD plant (e.g., San Mateo is a 10 MGD plant and generates approximately 200,000 scf per day from sewage alone)
- Prepared a summary document that will be distributed to California POTWs for their consideration

This and other projects have the potential to set a standard for offset protocols

- Potential offset protocols we are looking into:
  - Land application of biosolids/digestate
    - King County
    - Chicago
  - Low carbon fuel (biogas to transportation fuel) projects are underway
    - Jamesville, WI
    - San Mateo
    - Davis
    - Sacramento

ARB recently released its process for the review and approval of new Compliance Offset Protocols

- ARB to review protocols from both:
  - voluntary offset programs and coordinate with WCI partners
  - *proposed* protocols submitted by stakeholders
- Factors considered in addition to typical criteria:
  - Potential for projects in California
  - Potential offset supply
  - Cost-effectiveness
  - Co-benefits
- ARB and WCI partner jurisdictions to identify which offset project types to evaluate next for the regional trading program

Ultimately, regulators need to address barriers that POTWs face, including…

- Long-term risks to public agencies
- Reducing cost and regulatory (including permitting) barriers to get the necessary equipment for:
  - Pre-processing hauled-in waste streams (i.e., food waste) to a digestible form
  - Infrastructure for anaerobic digestion
  - Processing biogas into a pipeline grade or transportation biofuel in-place
- Need incentives (e.g., Cap-and-Trade funds)

CWCCG is working with ARB and Calrecycle to ensure the wastewater community is eligible to participate and receive financial support through Cap-and-Trade funds.

To date the Cap-and-Trade program has held five auctions and will link to others

- 5th auction took place November 19

As of 4th Auction	Number of Allowances Offered/Sold	Settlement Price	Average Settlement Price
Current Auction (2013 vintage)	13,865,422	$12.22	$12.48
Advance Auction (2016 vintage)	9,560,000	$11.10	$10.63

- Linkage Readiness Report released early November – no date set for the first linked auction between CA and Quebec, Quebec to run its own auctions first
- Agreement (MOU) between ARB and Australian Clean Energy Regulator

Unfortunately, Governor Brown took a loan from the GHG Reduction Fund for the State's General Fund

- Currently ~$396M in GHG Fund (unofficial estimate as of the 4th auction, 5th auction took place yesterday)
- Can take up to $500M by end of FY 13/14
  - No deadline set for repayment (with interest)
  - Auction proceeds from IOU's and POU's not affected
- Bioenergy Association of California is developing a letter/white paper for CARB's consideration for the investment plan

Opportunities for CWCCG to Inform Other State And Federal Efforts

The Pacific Institute wants to look at the vulnerability and adaptability of POTWs

- Invited CWCCG and Energy Workgroup members to help research the vulnerability and adaptation of the wastewater sector in the Bay Area to sea level rise and changes in precipitation patterns (may expand to State depending on available funding)
- Approaching State and/or Federal agencies for funding (e.g., Coastal Conservancy, NOAA, CA Water Foundation, Prop 84, etc.)
- Next steps: refining the proposal, identify additional grant opportunities, and seeking letters of support from agencies
- What would you want to know to help your agency decide if it wants to participate?

SWRCB invited CWCCG to be a panelist at their annual Water Boards meeting

- Requested we develop a presentation addressing "How Should the Water Boards Adapt?" with special focus on POTWs
  - Lack of financial incentives to restore and adapt infrastructure
  - Integrated watershed planning approach
  - Future wet weather management options
    - Low impact development / green infrastructure
    - Wetlands (natural treatment)
    - Blending policies – set appropriate design storms
  - Point-of-use treatment for recycled water use
  - Coordination of multiple permitting agencies on projects with multiple benefits

CEC has released a DRAFT *Energy, Air Quality, Water and Climate Change Co-Benefits of Renewable Power Generation and Fuels Roadmap*

- CEC hired UC-Irvine – Advanced Power and Energy Program to:

  "..identify the state of knowledge, research gaps, and recommended research pathways to maximize and quantify energy and environmental co-benefits of using renewable power generation and fuels in CA."

Research and development needs were identified and categorized in tables based on…

- Technological and fuel advancement research needs
- Environmental impacts
  - Greenhouse gas emissions
  - Air quality
  - Water resources
- Biopower (i.e., biomass, MSW, and biogas)
- Co-benefits

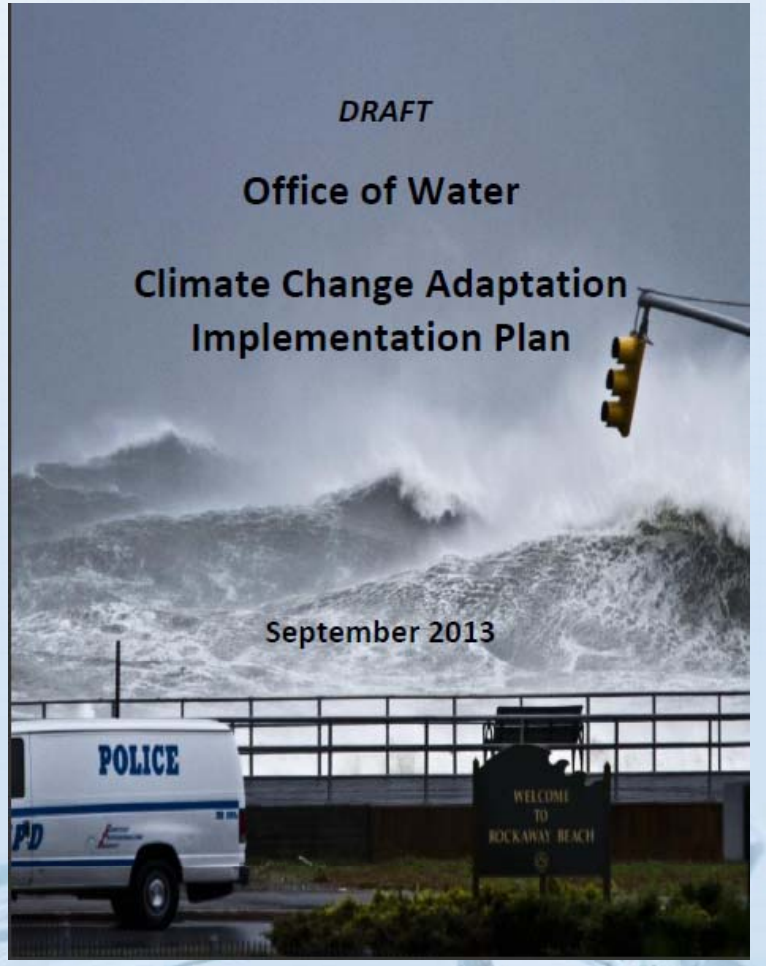
Only mentions digestion at wastewater facilities once and not a high priority. Opportunity to educate CEC!

CWCCG also has the opportunity to better inform the update to CA's Adaptation Strategy

- California Natural Resource Agency will release the draft *Safeguarding California from Climate Change* report by end of 2013
  - Update to the 2009 Climate Adaptation Strategy
  - Public workshop in Sacramento January 22, 2014, workshop in early January expected in San Francisco

As well as inform the U.S. EPA's Implementation Plans for the Federal Adaptation Plan

- U.S. EPA Office of Water Draft Implementation Plan released in November for review
  - Supports
    - Draft Climate Change Adaptation Plan (February 2013)
    - National Water Program 2012 Strategy: Response to Climate Change (December 2012)
  - 60-day comment period



EPA's Office of Water Implementation Plan is focused on clean and drinking water programs

Vulnerability of Water Resources

- Increases in water pollution problems as air and water warm
- More extreme weather events
- Changes in water availability
- Sea level rise/storm surge and water body boundary movement/displacement
- Collective impacts to coastal areas
- Indirect impacts resulting from changes in energy and fuel production

Of the 10 Priority Actions

- Update the Climate Resiliency Evaluation and Awareness Tool
- Use an Extreme Events Workshop Planner
- Encourage climate change consideration in SRF Loans
- Develop screening to identify water and wastewater facilities at risk on Atlantic and Gulf Coasts
- Integrate climate change considerations into water quality management planning projects and processes

CWCCG has participated in numerous workshops/meetings and has submitted 9 comment letters since April 2013

Date	Issue for Comment	Receiving Body
April 2013	Draft Cap-and-Trade Auction Proceeds Investment Plan for Fiscal Years 2013/14 through 2015/16	ARB
May 2013	Proposed 2013 Revisions to the U.S. EPA GHG Reporting Rule and Confidentiality Determinations for New or Substantially Revised Data Elements	U.S. EPA
May 2013	Draft Recycling and Composting Emissions Protocol	ICLEI USA
July 2013	Draft Waste Management Sector Plan	CalRecycle/ARB
August 2013	2013 Update to the AB 32 Scoping Plan (Kickoff Workshop Presentation)	ARB
October 2013	Final Waste Management Sector Plan	CalRecycle/ARB
November 2013	Potential Revisions to the Mandatory Reporting Regulation and Cap and Trade Regulation	ARB
November 2013	2013 Update to the AB 32 Scoping Plan (Discussion Draft)	ARB

Questions?

Thank you!

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http://www.casaweb.org/

GHG Regulation Applicability Summary

Regulation	Applicability Threshold	Actual or Potential	Biogenic Exclusion?	Sources Included
EPA Mandatory Reporting	25,000 metric tons/year	Actual	Yes (fossil fuel only)	Combustion only
EPA Tailoring Rule – PSD	Net increase of 75,000 short tons/year if already PSD source, or if current PTE is ≥ 100,000 short tons/year	Potential to Emit	No	Source undergoing major modification
EPA Tailoring Rule – Title V	Current Title V facilities and if current PTE is ≥ 100,000 short tons/year	Potential to Emit	No	All sources subject to air permits – open to air district interpretation
CA Mandatory Reporting	10,000 metric tons/year	Actual	No	Combustion only
CA Cap-and-Trade Program	25,000 metric tons/year	Actual	Yes (fossil fuel only)	Combustion only

Fuel Type	Fuel Units	Emission Factor Kg CO_2/Unit	Amount of fuel to produce 25,000 MT CO_2	Amount of fuel to produce 2,500 MT CO_2
Natural Gas (unspecified)	scf	0.05	459,140,464	45,914,046
	MMBtu	53.02	471,520	47,152
LPG (energy use)	Gal	5.79	4,317,757	431,776
Distillate Fuel (#1,2 &4)	Gal	10.14	2,466,011	246,601
Motor Gasoline	Gal	8.80	2,841,174	284,117
Landfill Gas	MMBtu	52.03	480,503	48,050
	scf	0.025*	916,301,950	91,630,195
Coal (unspecified other industrial)	Short Ton	2,082.89	12,003	1,200
Jet Fuel	Gal	9.56	2,614,682	261,468
Kerosene	Gal	9.75	2,562,972	256,297
Petroleum Coke	MMBtu	102.04	244,996	24,500
	Short Ton	2530.70	9,879	988
Crude Oil	Gal	10.29	2,430,348	243,035

*Note: The emission factor shown includes only the CO_2 emissions from the combustion of landfill gas. It does not include the CO_2 pass-through emissions, which are not counted for applicability purposes.