The background features a stylized image of the Earth, showing continents and oceans, with a soft blue glow. A horizontal blue bar with a slight gradient is positioned at the top of the slide. The text is centered and rendered in a bold, black, sans-serif font.

Greenhouse Gas Accounting for Carbon Capture and Sequestration

Presentation from Technical
Advisory Team
April 22, 2010

GHG Accounting Protocols

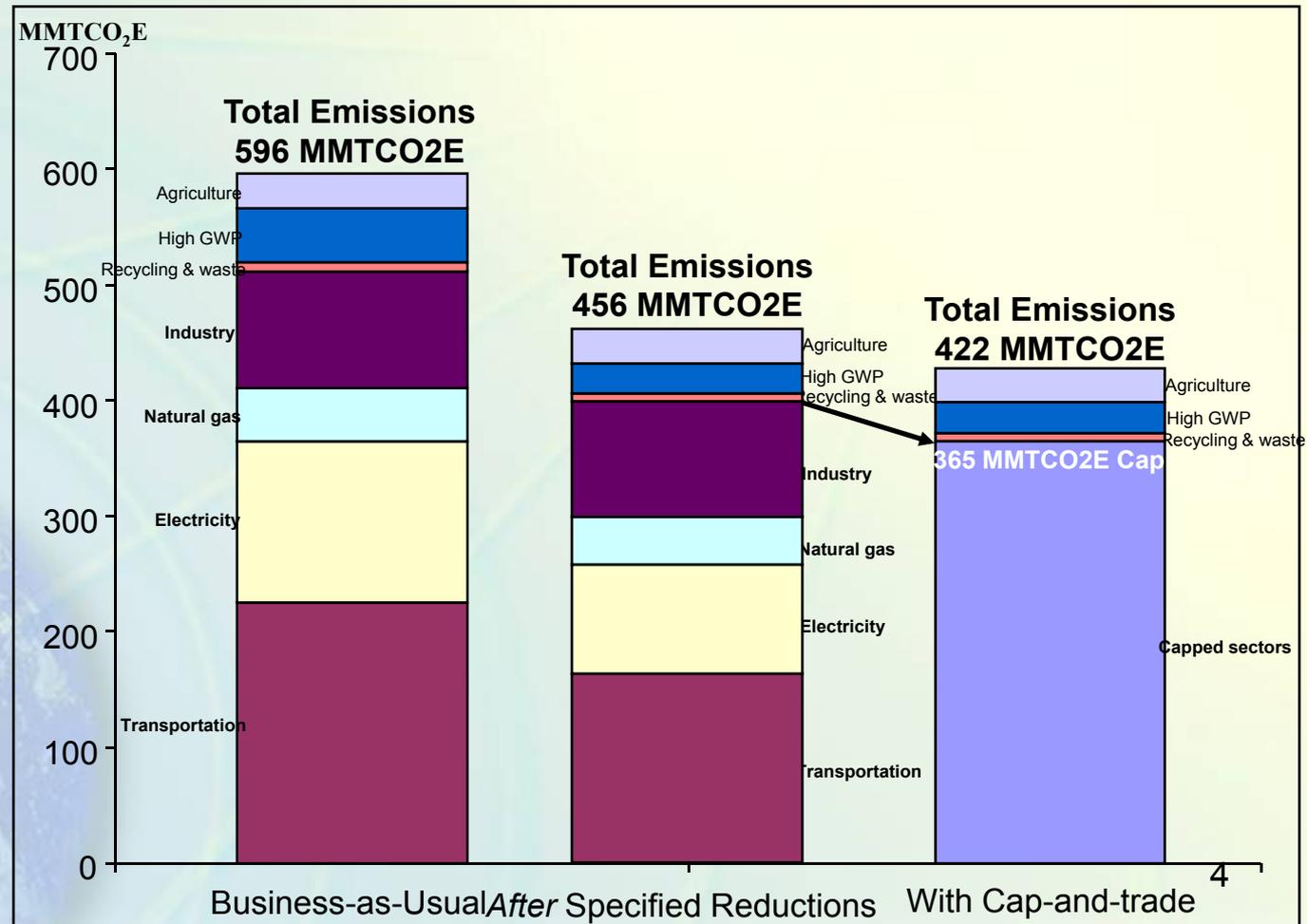
- Purpose: To allow for a standard methodology to account for greenhouse gas emissions and reductions
 - Could be for reporting or for a project/permit
- Ensures consistency and gives certainty
- Generally compliance-grade methods should:
 - Be transparent, reproducible, and standardized
 - Result in accurate and comprehensive estimates
 - Allow for verification and enforcement

California Agencies: Needs for a CCS GHG Protocol

- Multiple uses by state agencies
 - ARB: Compliance with AB32 related regulations
 - CEC/CPUC: Compliance with Emission Performance Standard
 - DOGGR (or USEPA): Underground Injection Control Program
 - Not used directly but similar monitoring, measurement, and verification processes may be needed for underground injection permit
- Ideally, processes could be coordinated and streamlined by use of a protocol

AB32 - Overview

- Cap and Trade
 - Mandatory Reporting
 - Allowances
 - Offsets (non-capped sectors)
- Direct Regulations
 - Low Carbon Fuel Standard
 - Refineries
 - Others



Potential Uses of CCS under AB32

- CCS may be used to meet various AB32 related regulations and mandates
 - Potential uses under Cap and Trade:
 - Mandatory GHG Reporting and Allowance Surrender
 - Offsets – from non-capped sources (minor for CCS)
 - Low Carbon Fuel Standard
 - High Carbon Intensity Fuels can use CCS
 - Future regulations
- Protocol likely to be necessary for Cap and Trade
- Without a protocol, case by case determination and potential for limited consistency within or across regulations

CCS GHG Accounting Scope

Purpose	Measurement, Monitoring, and Verification	Lifecycle	Additionality / BAU
LCFS (CCS is currently an option for high carbon intensity fuels)	√	√?	
Reporting (potential use)	√		
Offsets (potential use)	√		√
Future Regulations	√	?	?

CEQA must be considered for regulatory development and offset protocols

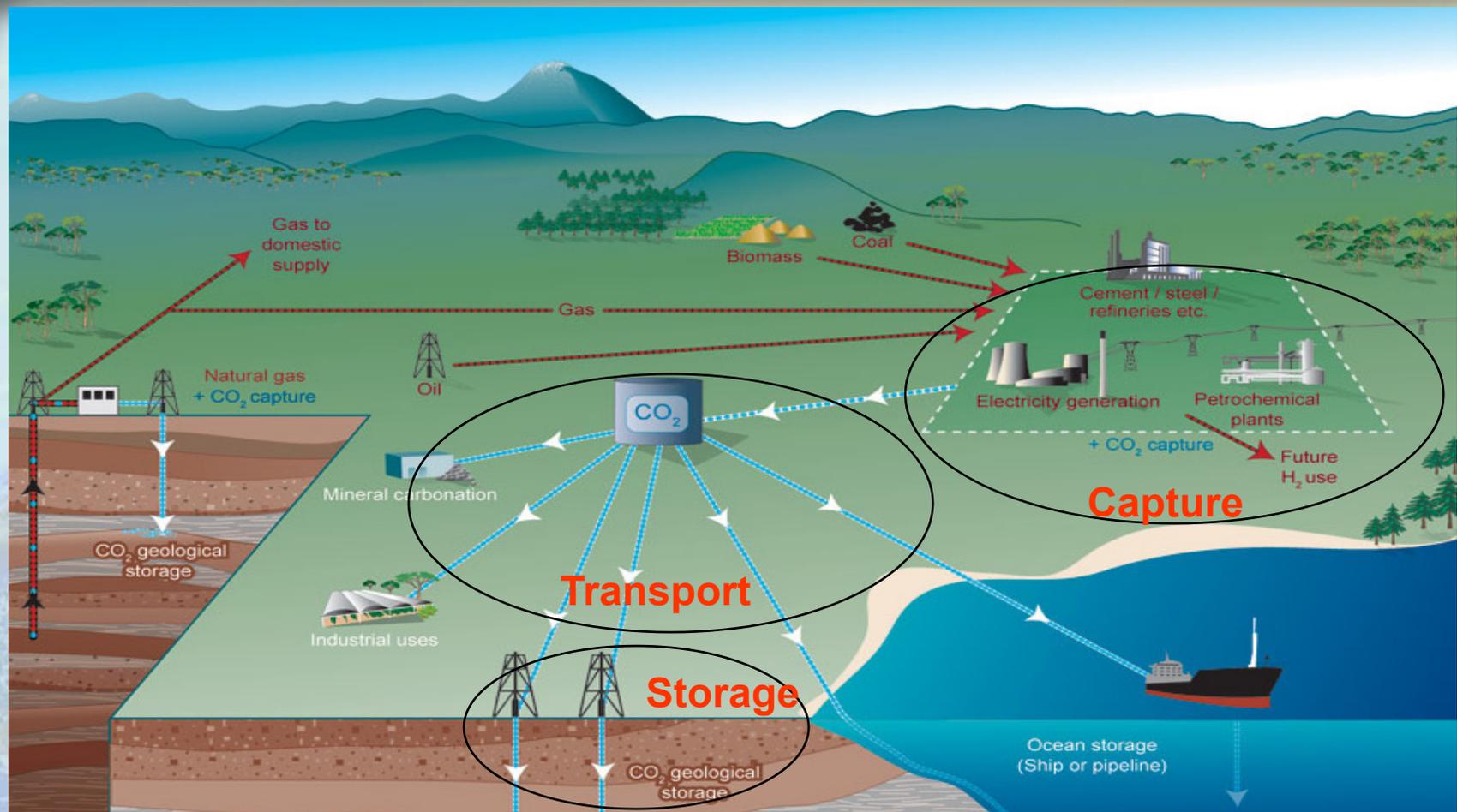
SB 1368 and CPUC/CEC

- SB1368: Emission Performance Standard
 - Average emission factor equal to or less than 1,100 lbs CO₂/MWh
- CPUC and CEC implement the standard
- CCS may be used to meet standard but no guidance on accounting
- Interactions SB1368 and AB32
 - Without a protocol, standardized treatment is more challenging
- Petition for Modification before CPUC
 - Filed November 30, 2009 by environmental and ratepayer groups
 - Seeks to add increased CO₂ monitoring

Underground Injection Control

- DOGGR/EPA implemented
- Monitoring:
 - Focuses on protecting underground sources of drinking water
 - Requirements differ by class
- For UIC, do not account for carbon but do need to track CO₂ plume and assure stability/safety
- Different needs but will require similar monitoring and measurement requirements

Coverage Needs



Details of how you account for the process will differ by program needs

Accounting Considerations

- Measurement, Monitoring, and Verification
 - Subsurface will be most involved
 - Monitoring requirements and detection limits
- Enhanced Oil Recovery has specific concerns and needs
 - More measurement and monitoring necessary for above ground facilities and surrounding area
 - How to account if intend to blow-down well(s) and move CO₂?

Available GHG Protocols

- Numerous Accounting Guidelines available
 - IPCC, CDM, API, EU, EPA, Vermont , Alberta, WRI, and others
 - All have bits of useful information
 - None are comprehensive enough for compliance purposes

Issues with Current Protocols

- General guidance only
 - Incomplete (EOR only, no subsurface monitoring)
 - Limited public review/input
 - Not adaptable to projects/reporting
 - Not enough detail or transparency
-
- Pew Center on Global Climate Change is beginning an effort to develop a multi-stakeholder, policy-neutral, and “open-source” methodology to be made available for a range of uses

Summary

- Agencies have different needs for GHG accounting or subsurface monitoring guidelines
- A protocol will enable the agencies to maintain consistency and provide certainty to project developers
- The challenge is that there are different needs
 - Project protocol vs. reporting protocol
 - Lifetime/Average vs. annual emissions
 - One-time vs. annual assessment