

# Establishing a Greenhouse Gas Emissions Performance Standard: Observations and Lessons from the California Experience

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# What is a GHG Emissions Performance Standard ("EPS")?

- Performance standard for electric generating facilities with respect to greenhouse gas (GHG) emissions
- Maximum level of GHG emissions per unit of output
- In California, expressed as lbs of CO<sub>2</sub> equivalent per megawatt-hour (MWh)\*

\*g/kwh or kg/mwh in other countries; lbs/mwh = 453.6/1000

g/kwh

# EPS as Appliance Standard

- Similar to an appliance efficiency



# Purpose of EPS in California

A specific policy tool to address climate change, one that serves to reduce:

- *Financial risk exposure* to the compliance costs associated with future GHG emissions regulations
- *Exposure to future reliability problems* in electricity supplies
- *Potential to “backslide”* during transition to statewide GHG cap (or as GHG emission limits become more stringent)

# Why Consider Adopting EPS In Conjunction with Cap-and- Trade?

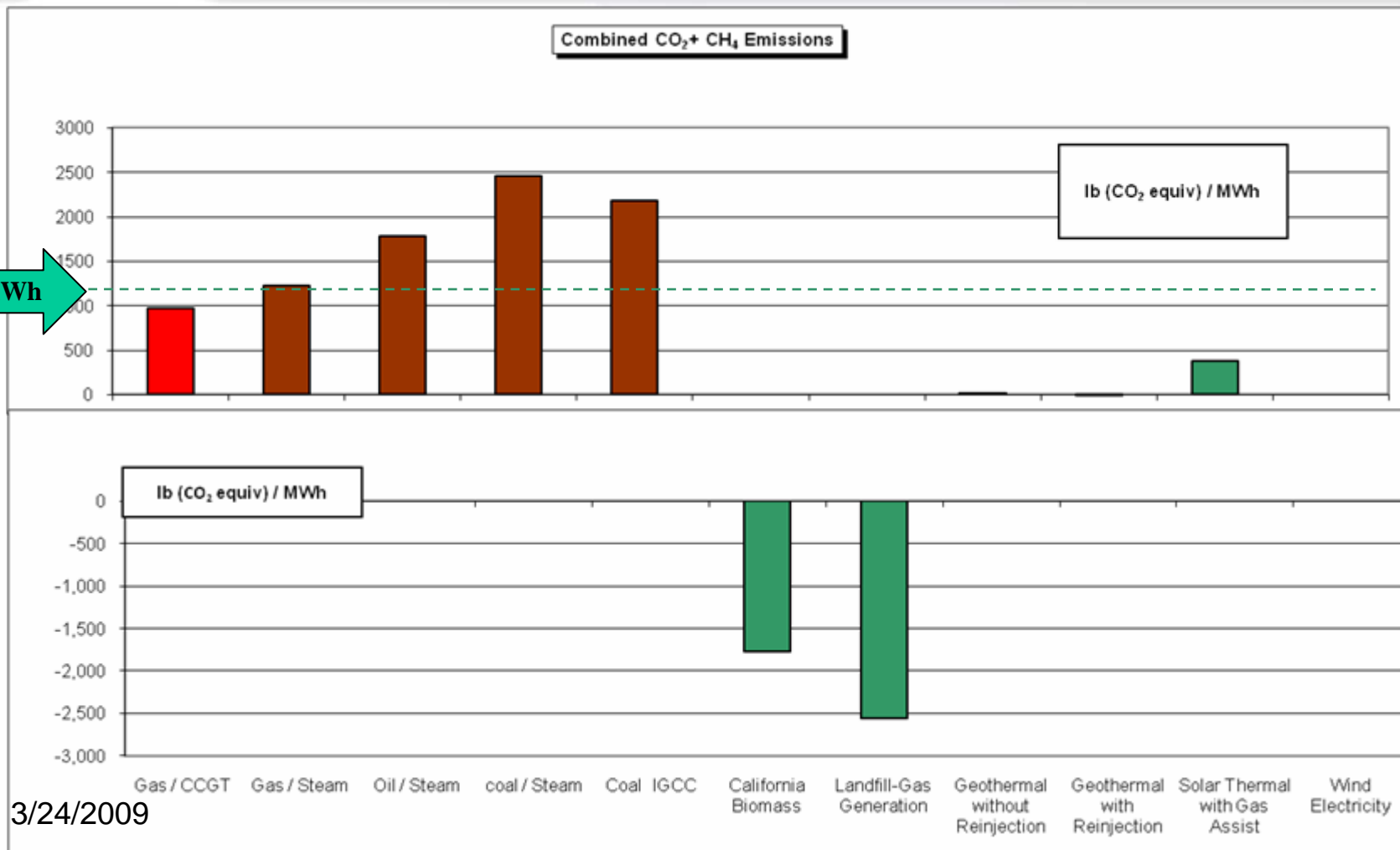
- If **market prices** under cap-and-trade are **unlikely to change the generation dispatch order or to induce new investments/technological advancements in clean generation** at a sufficient rate or magnitude to meet emission reduction goals
- If, in order to meet emission reduction goals through price alone, **market prices would need to increase and remain at an unacceptably high level**
- If current **cap-and-trade design permits unacceptable level of electric sector “carbon**



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# EPS Performance Level

# Representative GHG Emission Rates





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# **Point of Regulation (Who has to demonstrate compliance?)**



# What If...

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California's higher energy efficiency standards only applied to appliances manufactured within California's borders?



# Point of Regulation

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- Could not be focused on in-state generators
  - Did not have jurisdiction over out-of-state generators
  - Leakage risk substantial
- Load serving entities (LSEs) were required to demonstrate compliance with the EPS

# focused on LSE actions that:



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- Represented **new long-term financial commitments** to electric generation [**“go, no-go” gateway screen**]
  - LSE investments in new plant construction
  - LSE acquisition of new ownership share in power plants owned by others
  - LSE alternations to “retained generation”—existing, LSE-owned power plants that extend life significantly (five years or more) or increase rated capacity
  - New or renewal “long-term” contracts (5 years or more) between LSE with in-state or out-of-state generators—**and all sources of power had to be specified under those contracts**



# Carbon Capture and Storage (CCS)

# Addressing CCS in the EPS Rule

- Unabated coal-fired plants are effectively precluded under any EPS that is lower than approximately 900g to 1150 g of CO<sub>2</sub>/kWh
- How can an EPS be designed that both:
  - Precludes long-term commitments to plants that will have high emissions over their lifetime, but
  - Does not preclude viable plans for CCS that can meet the standard over time?
  - **Delaying the EPS was not a viable option in California**

# Treatment of CCS in California's Washington's (and Oregon's Pending) EPS



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- **(1) Make the EPS effective immediately for new long-term commitments and (2) give coal with CCS an opportunity to “pass the EPS screening” via a rigorous pre-approval process with stakeholder involvement**
  - Advantage: If the pre-approval requirements are meaningful enough to reduce uncertainty/risks of EPS non-compliance, this approach can “raise the bar” for emissions performance without “shutting the door” on CCS
  - Disadvantage: Requires extensive project-by-project review and approval of CCS plans before the CCS project is actually operational, and there is some risk 14 that the plant will be non-compliant on a life-cycle

# The California Rules and CCS



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Project Applicant Must Demonstrate that:

- (1) CO<sub>2</sub> injection project **complies with applicable laws and regulations**;
- (2) CO<sub>2</sub> capture, transportation and storage project has a **“reasonable and economically and technically feasible plan”** that will result in a **“permanent sequestration”** of CO<sub>2</sub> once the...project is operational”
- (3) **Emission levels will meet the EPS over the life of the plant** (with CCS accounted for over that life)

# The California Rules and CCS (cont.)



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**In practice** this means:

- Project comes before the Commission for approval
- Stakeholders have a public forum to review assumptions and raise concerns
- Project plan is feasible with enough CCS to meet the EPS
- Approval may be granted even if the CCS project may become operational after the power plant comes on line or the LSE enters into (or renews) the contract
- Commission approval may be subject to conditions (e.g. required start date of CCS)

# Washington State Rules and CCS



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CCS Plan Must Also:

- **Provide for a start date within 5 years of plant operation** for geological sequestration or other approved CO<sub>2</sub> storage method
- **Include penalty provisions** for failure to achieve implementation of the plan on schedule

# Impact of the EPS—Has it Made a Difference?

- We can never know for sure what “would have happened” if not for the California EPS
  - Washington, Montana and Oregon (pending) also adopted an EPS
  - Industry/Environmental coalition proposing EPS as part of a CCS policy component for national legislation on climate policy
  - Over 90 new unabated coal-fired power plants have been cancelled in the US over the last couple of years
    - Some of them were on the drawing board to serve California’s power needs
    - EPS sent financial community a clear signal that CO<sub>2</sub> emission rates are relevant to the financial risk profile of power plants
    - EPS elevated the issue of CO<sub>2</sub> emission rates in the permitting process across many states
- 3/24/2009 • EPS improved “transparency” of carbon risks by requiring that<sup>18</sup> all new long-term commitments be with specified power



# About The Regulatory Assistance Project

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RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP is funded by US Department of Energy, several foundations, and international agencies. We have worked in 40+ states and 16 nations.

Meg Gottstein served as Administrative Law Judge at the California Public Utilities Commission for over 20 years, and was a key architect of California's energy efficiency and climate change policies for the power sector. Before joining the Commission, Meg consulted for the US National Governor's Association and other clients on renewable energy, energy efficiency and other energy topics. In addition, she served from 1979 to 1981 in the Carter administration as the Department of Energy's Regional IX Director for the Appropriate Technology Grants program. Meg Gottstein received a Bachelor of Arts in German and Economics from Tufts University and a Masters of Public Policy from the Kennedy School of Government at Harvard.

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