

EPA Climate Change Initiatives: A Regional Perspective

Greenhouse Gas Strategies

San Francisco, CA

November 17, 2011



Amy Zimpfer, P.E.
Associate Director, Air Division
US Environmental Protection Agency
Region 9

1

Outline



- Update on EPA GHG Rulemakings
- Implementation at the Regional Level
- Looking forward: Areas Ripe for Further Work

2

Cost effective, common sense approaches to GHG regulation, leading to technology improvements.

Implementation and measurement will happen at the regional level, especially for stationary sources and will have benefit to region 9.

More and more we need to look at the co-benefits of all strategies.



Here are five key elements that you need to understand to see how far we've come the past few years. I'll talk about each one in chronological order, but first...

- They are all based around using the Clean Air Act to regulate GHG pollution
- There are two elements in the upper triangle and they rest on the foundation of the three below
- I'm also going to mention one other rule (RFS2) which is based on the 2007 Energy Bill
- There are also draft regulations for underground injection of carbon dioxide (based on Safe Drinking Water Act) that I'm not planning to discuss.

So let's begin with the center triangle...In 2007, the Supreme Court held that greenhouse gases are air pollutants covered under the CAA.

This landmark decision was the culmination of a decade of litigation regarding whether EPA could use its existing authority to regulate GHG emissions from new motor vehicles.

In the decision, the court directed EPA to Determine if GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare or whether the science is too uncertain to make a reasoned decision.

So, here is the judicial branch of government directing the executive branch to make certain narrow decisions based upon specific language in the CAA.

That leads directly to the second foundation block: The Endangerment Finding

Which were actually two distinct findings: EPA administrator Lisa Jackson, upon review of the science and in consideration of over 380,000 public comments, found that

- (i) GHGs threaten the public health and welfare of current and future generations
- (ii) emissions from motor vehicles contribute to greenhouse gas pollution

These findings do not themselves impose any requirements on industry or other entities

However, these findings were a prerequisite for finalizing GHG emission standards for light-duty motor vehicles....but, we are not there yet...

Our third and last foundation block is the GHG Reporting Rule which went into effect at the beginning of this year.

This rule requires many entities to measure and publicly report their GHG emissions. The rule generally applies to:

- Suppliers of fossil fuels and industrial GHGs
- Manufacturers of vehicles and engines
- Facilities that emit $\geq 25,000$ metric tons per year
- Additional source categories being added in 2010

There's one branch of government I haven't mentioned yet – Congress. In EPA's budget appropriations bill for fiscal year 2008, Congress directed EPA to develop a GHG Reporting Rule to collect accurate and timely data on greenhouse gas (GHG) emissions that can be used to inform future policy decisions. All three branches of government have been involved with these three elements of the nation's future climate policy.

Regional Perspective: GHG Reporting Rule



- 7000 facilities reporting nationally from 29 source categories
- Estimated 950 facilities reporting in EPA Region 9
- 2010 Data release scheduled for the end of the year—Region 9 providing compliance assistance and enforcement
- 2011 Report due to EPA March 31, 2012

4

Note later panel on GHG reporting

GHG Reporting

Estimated number of R9 facilities anticipated to report 2010 emissions: 950

However, I just learned that 7,000 - 7,500 facilities (nationally) actually registered via eGGRT out of an estimated 10,400. I do not know a breakdown for R9.

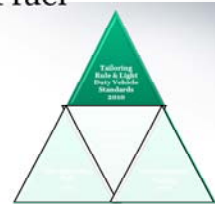
Lastly, keep in mind additional subparts will pull more facilities in for 2011 reporting
2010 reporting deadline is 9/30/11...therefore, we have no data yet, but are continuing to say we will publicly release data by end of 2011.

29 source categories reported. Biomass exemption pending SAB review of literature – in January we expect to receive draft feedback from SAB on technical report on accounting mechanism for biomass.

Vehicle GHG Standards



- 2012-2016 Lt. Duty Stds—Final 4/1/10
 - Cars 27.5 MPG→39.5 MPG
 - Small Trucks 23.1 MPG→29.8 MPG
- 2017-2025 Lt. Duty Stds—Proposal 11/16/11
 - Cars 39.5 MPG→54.5 MPG
- 2014-2018 Heavy Duty Stds—Final 8/9/11
 - 9 to 23% reduction in emissions & fuel consumption



5

Recall that the Supreme Court decision was based upon a case regarding regulation of new cars and trucks.

On April 1, 2010, EPA and NHTSA announced a joint final rule establishing a historic national program that will dramatically reduce greenhouse gas emissions and improve fuel economy for new cars and trucks sold in the United States. It applies to passenger cars and light-duty trucks for model years 2012 – 2016.

DOT used their authority to improve fuel economy (the so-called CAFE standards) and EPA used its authority under the CAA to regulate tailpipe CO₂ emissions.

Legal Challenges going through the courts—oral arguments before DC circuit February 2012

Heavy DUty

Regional Perspective: Light Duty Vehicle GHG Stds.



Projected benefits for Region 9:

	By the year...	Cumulative Reductions (MMTCO _{2e})
Light Duty Vehicle Rule	2020	156
Heavy Duty Vehicle Rule	2018	25

Other Region 9 Areas of Focus:

- Technology Advancement: Clean Air Technology Initiative
- Electric Vehicle Strategy
- West Coast Collaborative

6

Compare this to AB32, where cumulative emission reductions are mandated at 173 million tons of carbon dioxide equivalent through 2020.

have apportioned R9's reductions by take 15% of these numbers as we have approx. 15% of the US population

Stationary Source Permitting

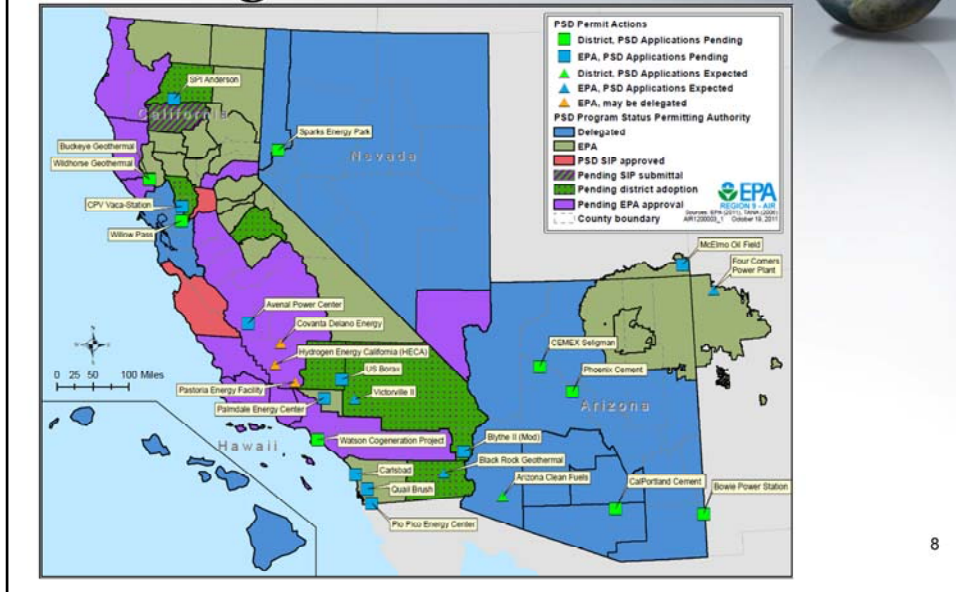


- Effective January 2, 2011
- “Tailors” the Clean Air Act requirements to the largest emitting facilities
- Covers nearly 70% of US GHG emissions from stationary sources (e.g., refineries, power plants, cement plants)
- Best Available Control Technology – energy efficiency, maintenance, system design, etc.



- This brings us to the Tailoring Rule. The CAA regulates air pollutants from both mobile (e.g., cars) and stationary (e.g., factory) sources. EPA’s (reconsideration of the Johnson Memo) interpretation of the CAA is that once a pollutant is regulated from a mobile source, it automatically triggers regulation for stationary sources as well. This is where the “Tailoring Rule” comes in...
- The Clean Air Act generally requires facilities to obtain air permits if they emit more than 100 or 250 tons per year (tpy) of criteria pollutants like lead, sulfur dioxide and nitrogen dioxide.
- While these thresholds are appropriate for criteria pollutants, they are not (by themselves) feasible for GHGs because GHGs are emitted in much higher volumes.
- Without the Tailoring Rule, the lower emissions thresholds would take effect automatically for GHGs resulting in millions of facilities needing permits.
- So this rule “tailored” the requirements of the act to accommodate GHG regulation. The rule phases in GHG permits beginning Jan. 2, 2011.

Regional Perspective: Tailoring Rule



8

GHG BACT

11/16/11 EPA issued a permit to the City of Palmdale, Calif. for the construction and operation of the Palmdale Hybrid Power Project. The 570 megawatt natural gas-fired power plant, with 50 megawatts of solar energy generation, is the first of its kind in the nation required to limit greenhouse gas emissions. Commercial operation is planned for the summer of 2013.

The permit sets limits for carbon dioxide emissions at 774 pounds per megawatt-hour of power produced, while the clean solar component can generate enough energy each hour to recharge about 750 electric vehicles.

The Palmdale project, located in the desert of Antelope Valley, combines the use of natural gas-fired technology with that of solar, using mirrors to capture sunlight for conversion into electricity. The solar input will provide around 10% of the peak power generated by the plant during periods of highest energy demand. This innovative combination will result in one of the cleanest and most efficient fossil fuel-fired power plants in the nation.

There are now 8 agencies in Region 9 that have delegated 40 CFR 52.21 PSD authority for GHG sources. This includes Hawaii, all of Arizona, all of Nevada except Clark County, and the Bay Area in CA.

Fourteen other agencies have developed PSD programs through their local rules that are SIP-approved or are candidates for SIP approval. Those 14 that are SIP-approved or have submitted their Board-adopted rules to our office are:

- .Bay Area,
- .San Joaquin Valley,
- .South Coast,
- .Clark,
- .Imperial County,
- .Placer County,
- .San Luis Obispo,
- .Santa Barbara,
- .Ventura,
- .Mendocino,
- .Northern Sonoma,
- .North Coast,
- .Monterey, and
- .Sacramento.

Remaining state and local permitting agencies we have left to work with to adopt local rules to permit GHG sources,:

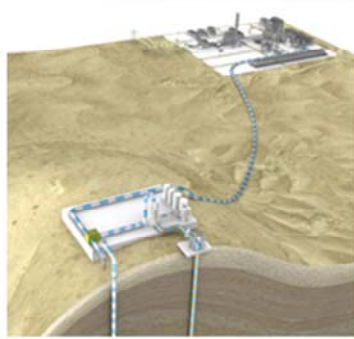
- .Eastern Kern,
- .Great Basin,
- .Mojave Desert,
- .Shasta County,
- .Yolo-Solano, and
- .San Diego.

The ones not mentioned in these lists I've provided are not considered high priority areas due to low PSD permitting activity.

Regional Perspective: Carbon Sequestration



Hydrogen Energy California (HECA)



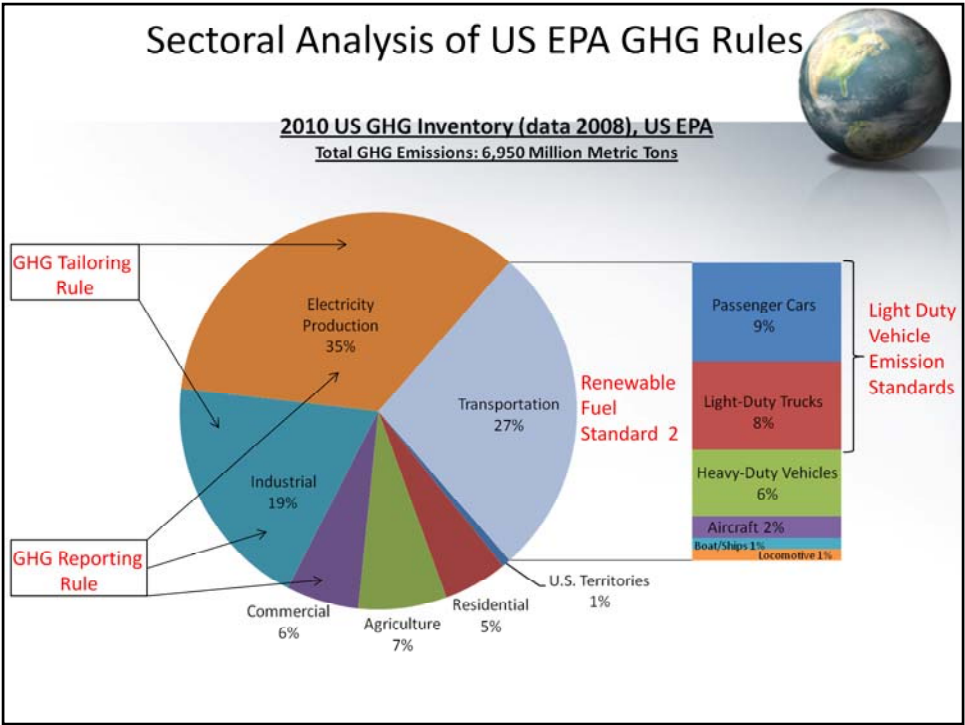
<http://hydrogenenergycalifornia.com/>

- 300 MW capacity
- 90% CO₂ to be injected into Elk Hills Oil Field for enhanced recovery
- DOE funding
- New ownership has pushed back project timetable

9

SCS plans to modify the project such that it can be used to produce urea for commercial sale, as well as produce electricity and capture CO₂ for enhanced oil recovery and sequestration. SCS Energy stated that it expects to submit a revised PSD permit application as early as March 2012. At this time, San Joaquin Valley APCD, not EPA, is likely to issue the PSD permit for this project, as I mentioned in my previous message. Construction of the project will depend on when the appropriate permit and California Energy Commission approvals are issued.

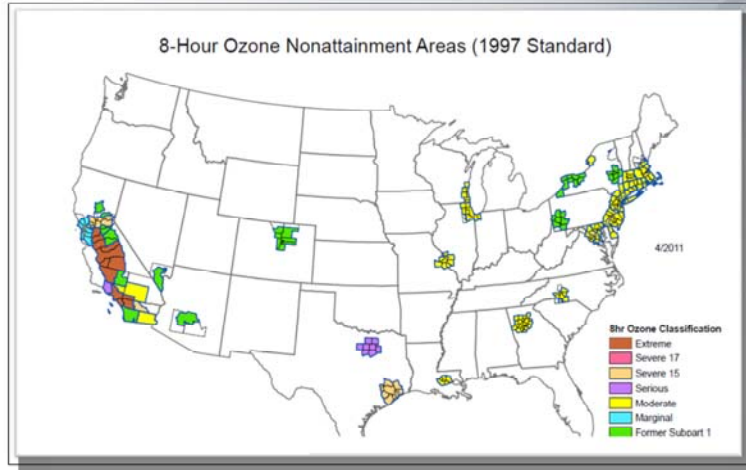
Occidental will monitor the CO₂ that enters onto its property from HECA. Nothing has been submitted to EPA regarding this. Occidental submitted a draft monitoring, reporting, and verification (MRV) plan to the California Energy Commission.



This pie chart summarizes several of the rules that EPA has out on GHGs which I have covered today. As you can see, they touch all the major sectors that contribute to significant climate emissions in the US.

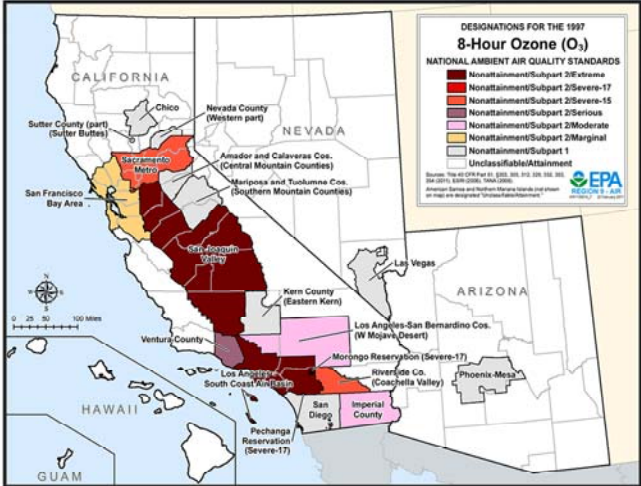
Economic sector breakdown of US GHG emissions showing existing national GHG rules and affected sector(s). The percentages shown represent the percent contribution to total US GHG inventory.

Air Quality - National Ozone

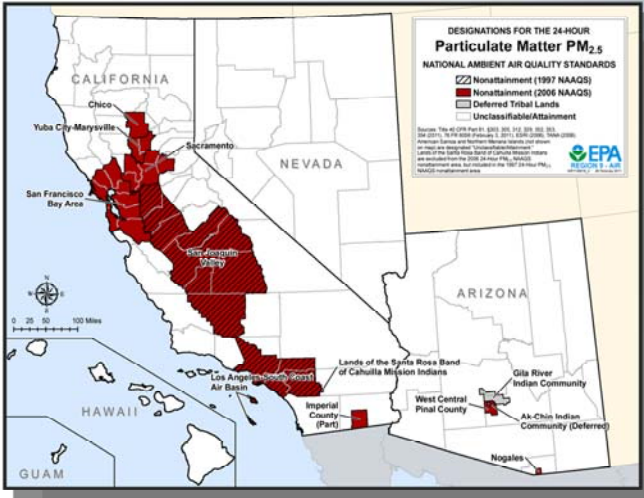


11

Air Quality – Regional Ozone



Air Quality – Regional PM_{2.5}



Air Quality - National PM_{2.5}



GHG and Criteria Pollutant Strategies



- Diesel emission reductions: PM2.5 & Black Carbon
 - Diesel Emission Reduction Act/West Coast Collaborative
- Local CO2 Domes: Emerging research on elevated CO2 effects on criteria pollution
- State Implementation Plans: Co-benefits
- Energy Efficiency: Reduced GHG & criteria emissions
- Renewable Energy:
 - RE-Power America—Develop renewable energy on disturbed lands
 - Since 2009, Region 9 commented on over 70 projects
 - EPA-BLM MOU on Renewable energy projects in AZ

15

Diesel black carbon:

Black carbon is a sooty black air pollutant resulting from the burning of most fuels. It is a component of PM2.5 and has negative implications for both human health and our climate. DERA has reduced a significant amount of PM2.5 along the west coast and these reductions not only improve the health of our local communities but also aid in reducing the effects of climate change in the near-term.

CO2 domes:

In a study (Jacobsons 2010) examining emissions at several scales- globally, the US, California, LA --- data suggests that domes of high CO2 levels form over cities. That study showed that these domes can increase local ozone and particulate matter, with an estimated increase in premature mortality by 50-100 and 300-1000 deaths/yr in California and the U.S., respectively

SCAQMD :

Every three years, AQMD prepares an AQMP for the air quality improvement. Each iteration of the plan is an update of the previous plan and has a 20-year horizon. Plans range in scope from the regional Air Quality Management Plan (AQMP) to plans dealing with specific pollutants in specific geographic locales. Included as part of a plan are documents that analyze its impact (i.e., socioeconomic and environmental analyses). On September 28 and 29, 2011, the SCAQMD hosted an Air Quality Technology Symposium at the Diamond Bar Headquarters to solicit new and innovative concepts in an open forum. These concepts are being further analyzed for potential inclusion in the 2012 AQMP, which is currently being developed as an integrated plan to implement zero or near-zero emission measures to reach attainment of particulate matter and ozone standards.

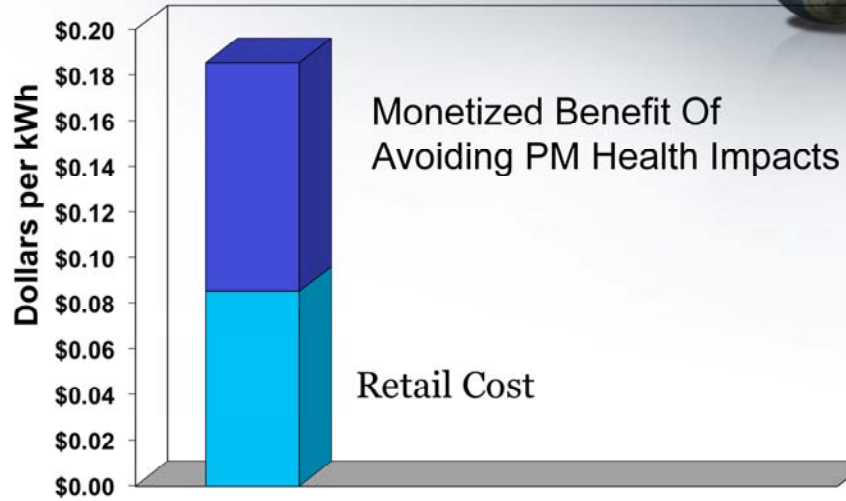
BAAQMD:

In addition to updating the Bay Area's state ozone plan, the CAP will also serve as a multi-pollutant plan to protect public health and the climate – the first-ever multi-pollutant air quality plan. The

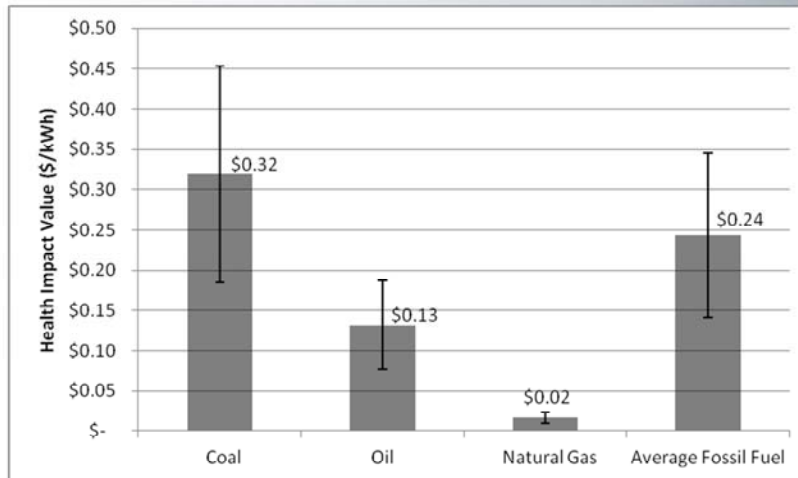
Air District believes that an integrated and comprehensive approach to planning is critical to respond to air quality and climate protection challenges in the years ahead. The CAP addresses four categories of pollutants:

- Ground-level ozone and its key precursors, ROG and NOx;
- Particulate matter: primary PM2.5, as well as precursors to secondary PM2.5;
- Air toxics; and
- Greenhouse gases.

PM Health Impacts of Electricity Production

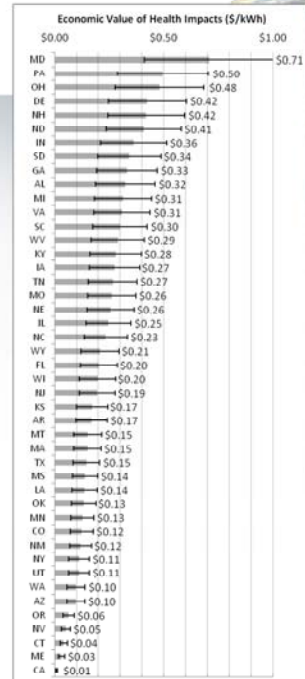


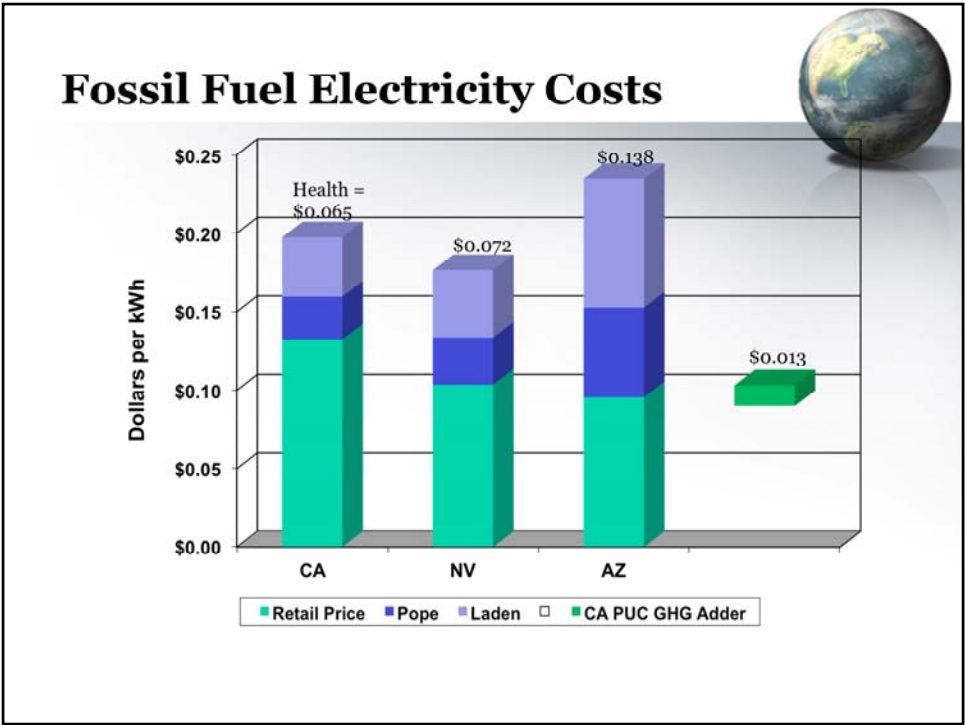
Economic value of health impacts represent 2.5-6.1% of US GDP



Impacts vary by state based of fuel mixes

- Highest impact value is in Maryland : \$0.41-\$1.01/kWh
- Lowest impact value is in California: \$0.006-\$0.013/kWh
- Inclusion of imported energy in California increases this figure to: \$0.03-\$0.07/kWh





2005 & 2009 Emissions. CA figure includes imports.

- Retail
- AZ 9.56
- CA 13.24
- NV 10.36
- HI 21.21

Looking Forward: Progress on Criteria Pollutants & GHGs



- Black Carbon – climate and health benefits of reducing diesel particulate matter
 - Diesel Control Technologies
 - Mobile Source Electrification
- Pushing the Energy Efficiency Envelope –
 - Build on successes in CA and NV
 - GHG BACT → energy efficient technology
- Renewable Energy—at all Scales
 - Utilize disturbed lands

20