Climate Change Changes Everything:

What You Need to Know Regarding Emerging Regulatory & Litigation Issues Concerning Global Warming

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STEPTOE&JOHNSON LLP

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Framing the Debate: A Layperson's Summary of the Scientific Case for and Against Global Climate Change

James Derouin, Partner

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The Clean Air Act and Greenhouse Gases

- What contaminants are regulated by the CAA?
- What are “greenhouse gases?”
- What is the significance of GHGs?
- Where do GHGs come from?

Conventional Air Contaminants (CAA) aka National Ambient Air Quality Standards

- Carbon Monoxide (CO)
- Sulfur Dioxide (SO_2)
- Particulate Matter (PM_{10})
- Nitrogen Dioxide (NO_2)
- Ozone
- Sulfur Oxide

Greenhouse Gases

- Water Vapor
- Carbon Dioxide (CO_2)
- Methane (CH_4)
- Nitrous Oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Sulfur Hexafluoride
- Perfluorocarbons (PFCs)

Why GHGs Are Important

- GHGs raise average temperatures on Earth to 60°F and are essential for the existence of life forms on Earth.
- Sun emits energy via relatively short radiation waves.
- Earth emits energy via relatively long radiation waves.
- GHGs emit and absorb longer wavelength radiant energy emitted from the Earth's surface.
- The absorption of long wave radiation by GHGs warms the atmosphere.
- The emission of long wave radiation from GHGs downward to Earth is the "greenhouse effect."

Total GHGs Approximates

- Water vapor (excluding clouds) = 70%
- Carbon Dioxide = 15%
- Methane = 8%
- Nitrous Oxides =]
- Hydrofluorocarbons =] 7%
- Sulfur Hexafluoride =]
- Perfluorocarbons =]

CO_2 Sources

- Wind exchange with salt water
- Animal and plant respiration
- Fossil fuel combustion
- Direct release from soil
- Volcanoes, hot springs and geysers

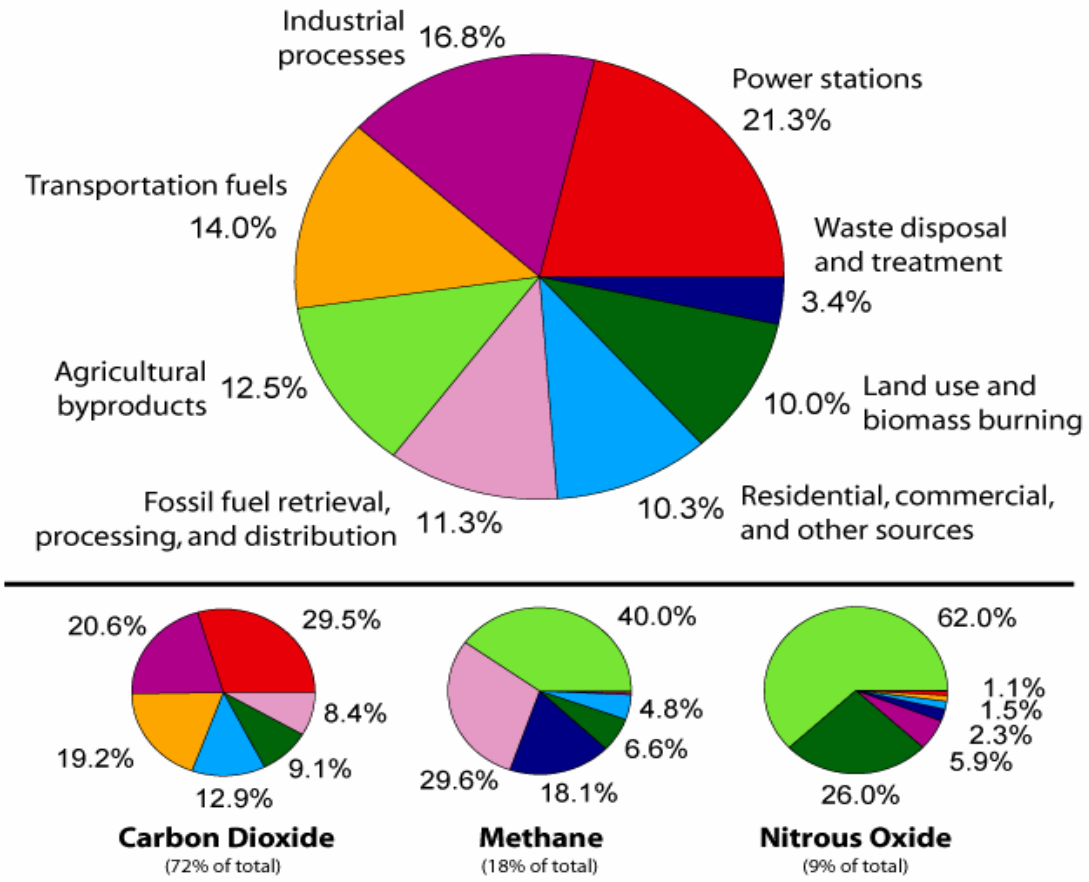
Methane Sources

- Wetlands
- Rice paddies
- Rumination from cows, sheep and wild animals
- Biomass burning
- Termites
- Gas drilling
- Landfills
- Coal mines

Nitrous Oxide Sources

- Soils in mid-latitude forests
- Fossil fuel combustion
- Biomass burning
- Nitrate and ammonia fertilizer

Annual Greenhouse Gas Emissions by Sector



What's the Controversy – Part I

- Non-water vapor GHGs – i.e., 30% of total GHGs
- More specifically, man-made (aka "anthropogenic") GHGS – i.e., <30% of total GHGs
- More specifically, CO_2 – i.e., 15% of total GHGs
- More specifically, anthropogenic CO_2 – i.e., <15% of total GHGs
- Most specifically, CO_2 = 72% of anthropogenic GHGs

Dr. Robert Balling - ASU

- CO_2 levels have increased from 203 ppm in 1888 to 351 ppm in 1988 (@ 60% +/-).
- Doubling CO_2 concentrations could warm Earth by 2.5°F.
- CO_2 levels 300 million years ago were 10 times higher during a time when Earth was the greenest it has ever been.
- CO_2 = atmospheric life of 50-200 years.
- The atmospheric concentration of CO_2 is rising and anthropogenic emissions are causing the increase in CO_2.

The Heated Debate – Balling

- "There is no doubt about it–human activities are substantially increasing the atmospheric concentration of CO_2, and these activities will certainly continue to force atmospheric CO_2 levels to climb. In the community of greenhouse scientists, there is virtually no debate surrounding this observed increase of atmospheric CO_2. The rate of increase has been measured throughout many parts of the globe, the rate is recognized to be exponential over the past 100 years, and the emission rates by nations are reasonably well known. Given the physical reality that CO_2 in the atmosphere acts to warm the earth by absorbing energy emitted by the earth's surface and atmosphere, one may safely conclude that the increase in atmospheric CO_2 will act to warm the earth to some degree."

What's the Controversy – Part II

- Accurately determining the magnitude of the impact of CO_2 to the Earth's climate – is the projected warming going to be 2.5°F and "tolerable" (Balling) or 9°F and catastrophic.
- How to calculate/predict the impact of CO_2 concentrations to the Earth's climate.
- The use of computer (general circulation) models to predict impacts.
- The complexity of the universe and Planet Earth.

From the Big Bang to Earth

- Age of universe = 13 – 20 billion years.
- Big Bang = zero size and infinite heat.
- All matter in universe = 2.2×10^{41} or 220,000,000,000,000,000,000,000,000,000,000,000,000,000 pounds.
- At the time of the Big Bang, all matter was compressed in an infinitesimal speck.
- When universe was the size of a bowling ball (a billionth of a billionth of a billionth of a billionth of a second after the Big Bang – plus one ten-billionth of a second) all the known particles and forces as we know them had come into existence.

From the Big Bang to Earth

- At one second after the Big Bang, the temperature of the universe had dropped to 10 thousand million degrees – a temperature equal to that in the center of the sun.
- Within a few hours of the start of the Big Bang, temperatures dropped to 10 million degrees, too cool to weld any more particles into atomic nuclei.
- Within a million years, the temperature of the universe had fallen to 4,000 degrees and all neutrons and protons had captured all the electrons they could hold.
- Our galaxy is one hundred thousand light years across.

From the Big Bang to Earth

- Our galaxy is only one of some hundred thousand million that can be seen using modern telescopes.
- Each galaxy contains some hundred thousand million stars.
- Speed of light = 186,000 miles per second.
- Galaxies are moving away from the point of the Big Bang at 90% of the speed of light.

From the Big Bang to Earth

- Age of Earth = 4.5 billion years.
- We are still inside the Big Bang because the universe is expanding.
- Earth is cooled by 40,000 gallons of water per square foot.
- 70% of Earth is covered by water.
- Gulf Stream is an ocean stream that carries 3 million cubic miles of warm water up to the North Atlantic every hour bringing more warmth to those high latitudes in one hour than could be provided by burning all the coal mined in the world for a year.

From the Big Bang to Earth

- Water vapor, a GHG, fuels all the winds of the Earth with around 12,000 cubic miles of liquid every year.
- The total quantity of water on Earth is much the same as it was more than 3 billion years ago, when the 326 million cubic miles of it were first formed.

From the Big Bang to Earth

- The most abundant elements in the universe are hydrogen (90%) and helium (9%).
- The most abundant elements in living organisms are carbon, hydrogen, oxygen and nitrogen.
- Historic concentrations of CO_2 were tens to hundreds of times what they are today.
- Historic concentrations were reduced by rainfall – the result being organic and inorganic limestone.

What's the Controversy – Part III

- Predictive tool = computer models.
- Computer models = not always predictive.
- GW computer are more predictive if:
  - Domain is small
  - Cells are small
  - Real data is prevalent
  - Boundary conditions are well defined
  - Domain is homogeneous
- Models of Mother Earth = subject to constraints on predictive accuracy because none of these conditions exist.
- Einstein: "God does not play dice."

Climate Modeling

- Policymakers are in the process of considering measures to address climate change.
- Policymakers rely on climate models to decide a variety of policy issues.
- There is a level of uncertainty involved in climate modeling.
- It is the role of policymakers to assess the level of certainty and determine whether it is sufficient to require action.

Climate Modeling

- Climate models have been developed to test the hypothesis of climate change because laboratory experimentation is impossible.
- Climate model – computerized mathematical representation of the physical processes that control the Earth's climate.
- Creating a model is extraordinarily challenging. There are a multitude of complicated interactive factors that affect the climate.

Climate Modeling

- Climate Model
  - Divides atmosphere, oceans and upper layers of soil into a three-dimensional grid.
  - Each grid box represents a location. One grid could represent an area the size of Ohio, or an area of only a few square miles.
  - Model starts with a snapshot of conditions.
  - A forcing factor, such as increased carbon dioxide concentrations, is then supplied to see how the model responds.

Climate Modeling

- Organizations and entities that have created models include:
  - National Center for Atmospheric Research.
  - U.S. Department of Commerce.
  - National Oceanic and Atmospheric Administration.
  - National Aeronautics and Space Administration.
  - National Center for Atmospheric Research.

Climate Modeling

- Processes that must be modeled
  - Incoming solar radiation.
    - Changes in the Sun (sunspots).
    - Changes in Earth's orbit.
  - Reflection of Sun's rays back into space.
    - Clouds.
    - Ice, sand.
    - Aerosols.
    - Snow flakes.

Climate Modeling

- Processes that must be modeled
  - Greenhouse effect (retaining a portion of the Sun's energy near the surface).
    - Water vapor.
    - Carbon dioxide.
    - Methane, nitrous oxide, tropospheric ozone.
  - Absorption of carbon dioxide by oceans and forests.
  - Blanketing (warming) effect of clouds.

Climate Modeling

- Processes that must be modeled
  - Chain reaction to reinforce or counteract initial trend.
    - Increased temperature. Warmer air holds more moisture. Water vapor is a greenhouse gas.
    - Warmer temperatures melt polar ice, reducing the amount of Sun's rays reflected away from Earth.
    - Warmer temperature releases carbon dioxide gases trapped in ice and frozen soil.
    - Burning fossil fuels increases amount of aerosols in atmosphere reflecting the Sun's rays.

Summary of the Case for Reliance

- Case for reliance is best made by the Intergovernmental Panel on Climate Change (IPCC).
  - Established 1988 by World Meteorological Association and UN Environmental Programme to assess scientific information regarding climate change.
  - Does not conduct modeling. It provides a regular assessment on state of knowledge and modeling done by others.
  - Fourth Assessment Report issued in 2007.

Summary of the Case for Reliance

- Fourth Assessment Report:
  - Considered twenty-three global climate models.
  - IPCC – considerable confidence that the models provide credible quantitative estimates of future climate change, particularly at continental scales and above.
  - Acknowledges that models contain uncertainty.
  - States conclusions drawn from models in terms of level of confidence – virtually certain, extremely likely, very likely, likely, more likely than not, etc.

Summary of the Case for Reliance

- IPCC's confidence in climate models comes from three sources:
  - Model fundamentals are based on established physical laws and on a wealth of observations.
  - Ability of models to simulate important aspects of the current climate.
  - Ability of models to reproduce features of past climates and climate changes.

Summary of the Case for Reliance

- Advances in Climate Modeling Since Third Assessment Report in 2001:
  - Improvement is the horizontal and vertical resolutions of the models – i.e., more grid boxes.
  - More processes have been incorporated into the models, in particular with regard to aerosols, and land surface and sea ice processes.
  - Parameterizations of the physical processes have been improved. Most models no longer use flex adjustment to reduce climate drift.

IPCC Fourth Assessment Report (2007)

- "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."
- "Most of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations. It is likely there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica)."

IPCC Fourth Assessment Report (2007)

- "Continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century."
- Overall projected temperature increases by 2100 range from about 1 degree Fahrenheit to 11 degrees Fahrenheit, depending on the scenario assumed.

Summary of the Case Against Reliance

- Problems with the Physics of Global Climate Models:
  - Uncertainty as to whether warmer air will hold additional water vapor.
  - Uncertainty regarding the amount of cloudiness in a changed environment.
  - Uncertainty regarding overall effect of aerosols (warming or cooling).
  - Uncertainty regarding indirect effect of aerosols on cloud formation.

Summary of the Case Against Reliance

- Problems with the Data Used
  - Models are based on surface temperature records that are inadequate to determine the average annual temperature of the Earth.
    - Recording stations concentrated in North America and Western Europe.
    - Few ocean weather stations.
    - Few stations in deserts, tropical forests, mountain and the arctic.
    - Most temperature records go back only 50 years.
  - Models are based on very few above-surface temperature records.

Summary of the Case Against Reliance

- Models based on questionable assumptions regarding future economic growth, population growth and energy demand.
- Models fail to represent reality. Made up of arbitrary horizontal and vertical grids. In reality, the Earth's climate is continuous, fluid and constantly interacting.

Bryson – University of Wisconsin

"It's absurd. Of course it's going up. It has gone up since the early 1800s, before the Industrial Revolution, because we're coming out of the Little Ice Age, not because we're putting more carbon dioxide into the air."

Reid Bryson, Emeritus Professor of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison

Gray – Colorado State University

"Human kind has little or nothing to do with the recent temperature changes. We are not that influential."

William M. Gray, Professor of Atmospheric Science, Colorado State University

Murty – University of Ottawa

"The atmosphere hasn't changed much in 280 million years, and there have always been cycles of warming and cooling. The Cretaceous period was the warmest on earth. You could have grown tomatoes at the North Pole."

Tad Murty, Oceanographer; Adjunct Professor, Departments of Civil Engineering and Earth Sciences, University of Ottawa

Patterson – Carleton University

"In fact, when CO_2 levels were over ten times higher than they are now, about 450 million years ago, the planet was in the depths of the absolute coldest period in the last half billion years. On the basis of this evidence, how could anyone still believe that the recent relatively small increase in CO_2 levels would be the major cause of the past century's modest warming."

Tim Patterson, Paleoclimatologist and Professor of Geology at Carleton University in Canada

Singer – University of Virginia

"The greenhouse effect is real. However, the effect is minute, insignificant, and very difficult to detect. It's not automatically true that warming is bad, I happen to believe that warming is good, and so do many economists."

Fred Singer, Professor Emeritus of Environmental Sciences at the University of Virginia

General Conclusions

- Models are becoming more sophisticated.
- There will never be a model that is 100% accurate or even close thereto.
- The more general the conclusions reached, the less accurate a model needs to be, but the less useful its conclusions.
- Climate models are the most predictive tool available.
- Policymakers must determine if the level of accuracy provided by current models is sufficient to require action.

Overall Conclusions

There are times I almost think
Nobody sure of what he absolutely know.
Everybody find confusion
In conclusion he concluded long ago
And it puzzle me to learn
That tho' a man may be in doubt of what he know,
Very quickly he will fight . . .
He'll fight to prove that what he does not know is so!
Is a puzzlement!

Scientists will continue to fight to prove that "what they do not know is so."

Overall Conclusions

- But the political system has made up its mind – the train has left the station.

- As a result, CO_2 and other anthropogenic GHGs will be limited without regard to the scientific debate.

Overall Conclusions

"Whether you think climate change is real or not, the politics are real. If you look at the presidential candidates, nearly all have said we need to address climate change. As a business, you have to at some point project the future and get yourself ready for that."

Ed Fox, Vice President and Chief Sustainability Officer for APS. Arizona Republic, January 20, 2008.

Federal and International Efforts to Address Climate Change

Mark Freeze, Special Counsel

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Kyoto Protocol

- Outgrowth of UNFCCC.
- Adopted December 1997.
- Entered into force February 26, 2005.
- U.S. not a party.

Kyoto Protocol

- Emission Limits
  - Apply only to Annex 1 parties.
  - Apply only during the commitment period of 2008 to 2012.
  - Apply to six greenhouse gases.
  - Objective is to reduce emissions from Annex 1 countries to 5.2% below 1990 levels by 2012.

Kyoto Protocol

- Emission Limits
  - Each Annex 1 party given an Assigned Amount of GHG emissions for the commitment period.
  - Expressed in terms of carbon dioxide equivalents.
  - An Annex 1 party's GHG emissions during commitment period may not exceed the party's Assigned Amount.

Kyoto Protocol

- Accounting For and Reporting Emissions.
  - Each Annex 1 party must have a system for estimating emissions.
  - Methodologies must be approved by IPCC and the COP.
  - Annual inventories must be submitted.
  - Information submitted is reviewed by an expert review team.

Kyoto Protocol

- Meeting Commitment Not to Exceed Assigned Amount.
  - Issue AAUs to its account.
  - Each AAU equals 1 metric ton of carbon dioxide equivalent GHG emissions.
  - May meet commitment by presenting and retiring AAUs equal to actual emissions.
  - If an Annex 1 party does not hold sufficient AAUs, it has failed to meet its commitment.
  - AAUs in excess of emissions may be banked.

Kyoto Protocol

- Meeting Commitment Not to Exceed Assigned Amount.
  - May take certain land use, land use change and forestry project activities to remove GHGs.
  - Annex 1 party will issue to its account RMUs equal to GHGs removed by the activity.
  - RMUs are added to AAUs.
  - RMUs may not be banked.
  - Amount of RMUs available from forest management activities is capped.

Kyoto Protocol

- Meeting Commitment Not to Exceed Assigned Amount.
  - May increase assigned amount by engaging in market-based activities called flexible mechanisms.
  - Purpose of flexible mechanisms is to allow reduction in GHGs to occur where they can be taken most cost effectively.
  - Penalized for failure to meet commitment.
    - Deduction from assigned amount for second commitment period.
    - Suspended from using flexible mechanisms.
    - Compliance action plan.

Kyoto Protocol

- International Emissions Trading.
  - Annex 1 party may buy, sell or trade AAUs, RMUs or other units issued pursuant to the other two flexible mechanisms to meet commitment.
  - Must have met requirement to estimate, inventory and report GHG emissions.
  - Must maintain reserve of lower of 90% of assigned amount or 5x most recent annual inventory.

Kyoto Protocol

- Joint Implementation
  - Annex 1 party may acquire from another Annex 1 party ERUs.
  - Resulting from projects conducted in the host Annex 1 country to reduce emissions or enhance removals.
  - Acquiring party may add the ERUs to its assigned amount.
  - Banking limited to 2.5% of assigned amount.

Kyoto Protocol

- Joint Implementation
  - Must have approval of both parties.
  - Additionality requirement.
  - Party acquiring ERUs must be in compliance with obligations to estimate, inventory and report GHG emissions.
  - Acquisition of ERUs should be supplemental to domestic actions to reduce emissions.
  - Projects must be verified by host country or supervisory committee.

Kyoto Protocol

- Clean Development Mechanism
  - Annex 1 party may acquire CERs from a developing country.
  - Resulting from projects in the developing country to reduce emissions or enhance removals.
  - Annex 1 party may add CERs to its assigned amount.

Kyoto Protocol

- Clean Development Mechanism
  - No CERs generated from nuclear facilities.
  - Eligibility of land use, land use change and forestry projects is limited to afforestation and reforestation.
  - Total of additions to assigned amount from afforestation and reforestation is limited to 1% of base year emissions times five.

Kyoto Protocol

- Clean Development Mechanism.
  - Reductions and removals must be certified. To be certified there must be:
    - voluntary participation.
    - real, measurable, long-term benefits.
    - Additionality.
  - Annex 1 party must be in compliance with its obligation to estimate inventory and report GHG emissions.

Kyoto Protocol

- Clean Development Mechanism.
  - Share of proceeds from CDM project must be used to cover administrative expenses.
  - Share of proceeds must be used to help vulnerable developing countries meet the cost of adaptation.
  - Prompt start mechanism (2000 to 2007).
  - Banking of unused CERs limited to 2.5% of Annex 1 party's assigned amount.

Kyoto Protocol

- Bali Conference: 12/3-15/2007
  - Roadmap for successor agreement after 2012.
  - Parties agree to deadline of 2009 to draft agreement.
  - No specific emission reduction targets.
  - Developing countries acknowledge need to make reductions.

Lieberman/Warner

- Capping GHG Emissions
  - Passed Senate Environment and Public Works Committee.
  - Regulates 6 GHGs.
  - Refers to GHGs in terms of carbon dioxide equivalents – the quantity of GHG that make the same contribution to global warming as one metric ton of carbon dioxide.

Lieberman/Warner

- Capping GHG Emissions
  - Covered Facilities.
    - Facilities in the Electric Power Generating Sector with fossil fuel fired generating units that emit more than 10,000 CDEs of GHGs a year.
    - Facilities in the Industrial Sector that emit more than 10,000 CDEs of GHGs a year.
    - Facilities that in a year produce or import petroleum or coal-based transportation fuel the use of which would emit more than 10,000 CDEs of GHGs.
    - Facilities that in a year produce or import nonfuel chemicals the use of which would emit more than 10,000 CDEs of GHGs.

Lieberman/Warner

- Capping GHG Emissions
  - Reporting Requirements.
    - Affected Facilities must submit emission data for 2004-2007 by March 31, 2009.
    - For 2008 forward, must submit quarterly emissions data.
    - Affected Facilities include Covered Facilities and any other facilities emitting GHG that EPA wants to include.
    - Affected Facility does not include a facility that (1) is not a Covered Facility; (2) is owned or operated by a small business; and (3) emits fewer than 10,000 CDEs a year.

Lieberman/Warner

- Capping GHG Emissions.
  - Each year, each Covered Facility must submit one Emission Allowance for each CDE emitted by that facility during the preceding year.
  - Producers/importers of transportation fuel must submit one Emission Allowance for each CDE that will be emitted upon use of the fuel (similar requirement for producers/importers of non-fuel chemicals).
  - Alternatively, a Covered Facility may satisfy a portion of its requirement by submitting Domestic Offset Allowances or International Allowances.

Lieberman/Warner

- Capping GHG Emissions.
  - ACSA establishes total number of Emission Allowances for each year between 2012 and 2050.
  - Covered Facilities obtain emission allowances by a variety of methods, including allocation and auction.
  - Total emissions allowances for 2012 is 5,200 million.
  - The amount decreases each year. By 2050, it is 1,560 million.
  - 70% decrease from 2012 to 2050.

Lieberman/Warner

- Managing and Containing Costs
  - Emission Allowances may be sold, transferred, retired or submitted to EPA to cover emissions.
  - Not limited to Covered Facilities.
  - May be banked.
  - Covered Facility may borrow Emission Allowances from up to 5 years in the future to satisfy up to 15% of its current year requirement.
  - Borrowed Emission Allowances must be paid back with 10% interest.

Lieberman/Warner

- Managing and Containing Costs
  - Domestic Offset Allowances.
    - A Covered Facility may satisfy up to 15% of its current year requirement by submitting Domestic Offset Allowances.
    - Generated by EPA approved agricultural, forestry, land use and other projects undertaken to reduce or sequester emissions.
    - Allowances are issued to the project developer and can then be sold.

Lieberman/Warner

- Managing and Containing Costs
  - International Credits
    - A Covered Facility may satisfy up to 15% of its current year requirement by submitting International Credits.
    - Emission Allowances obtained on an EPA approved foreign GHG trading market.
    - To be approved, the International Credit must have been issued by a foreign country pursuant to a government program that imposes mandatory absolute tonnage limits on GHGs pursuant to protocols adopted in accordance with the UNFCCC.

Lieberman/Warner

- Managing and Containing Costs
  - Carbon Market Efficiency Board
    - Purpose is to ensure stable and efficient market, and to ensure that the limits on GHGs will not significantly harm the economy.
    - Board may take the following measures:
      - increase quantity of EAs that Covered Facilities may borrow.
      - expand time period to pay back borrowed EAs.
      - lower interest rate for borrowed EAs.
      - increase quantity of International Credits that can be used to meet annual submission requirements.
      - increase quantity of Domestic Offset Allowances that can be used to meet annual submission requirements.
      - expand total quantity of EAs available to all Covered Facilities by borrowing EAs from future years.

Lieberman/Warner

- Allocation of Emissions Allowances
  - To Covered Facilities
    - To Electric Power and Industrial Sector. 2012-2035. 20% each in 2012. 1% each in 2035.
    - Set aside a quantity for new entrants in sector.
    - To each Covered Facility in the sector.
      Quantity Available x Average Annual Quantity of CDEs emitted for 3 yrs preceding enactment / average annual quantity of emissions for all facilities for preceding 3 yrs

Lieberman/Warner

- Allocation of Emissions Allowances
  - To Climate Change Credit Corporation
    - Private, non-profit corporation created by ACSA.
    - Early allocation: 6% of EAs for 2012, 4% for 2013, and 2% for 2014.
    - Annual allocation: 2012 to 2050. 18% in 2012. Increases each year to 2036. 73% for 2036 to 2050.

Lieberman/Warner

- Allocation of Emission Allowances
  - To Early Reduction Actions.
    - Within two years of enactment, EPA is to allocate EAs to those Covered Facilities that made verified and creditable reductions of GHGs before the enactment of ACSA and since 1994.
  - To the States
    - 9% annually. To each state based on certain formulas.
    - Proceeds to be used for, among other things, mitigate impacts on low-income energy consumers, promote energy efficiency, promote investment in non-emitting electricity generation, improve public transportation, encourage advances in energy technology, address impacts of climate change, mitigate obstacles to investment by new entrants in electricity generation market and energy-intensive manufacturing sectors.

Lieberman/Warner

- Allocation of Emissions Allowances
  - For Electricity Consumers
    - 10% each year to load serving entities delivering electricity to retail consumers.
    - Allocated among load serving entities based on quantity of electricity delivered by entity divided total quantity delivered by all entities.
    - Entities must sell all allowances at market price and use proceeds to mitigate economic impact on low and middle income energy consumers and to promote energy efficiency.

Lieberman/Warner

- Allocation of Emissions Allowances
  - To Carbon Capture and Sequestration Projects.
    - 4% of EAs for 2012-2035 (3,932,160) are allocated to a Bonus Allowance Account.
    - These EAs will in turn be allocated to qualifying carbon capture and sequestration projects from 2012 through 2039.
    - Number of EAs allocated to an individual project each year equals tons of GHGs sequestered times the bonus allowance rate for that year. Rate for 2012-2017 is 4.5. Rate then declines. By 2032, the rate is .5.
    - To be eligible, a project must (1) comply with EPA requirements, including 85% capture rate; (2) sequester in a geological formation permitted for that purpose; and (3) have begun operations between 1/1/08 and 12/31/35.

Lieberman/Warner

- Allocation of Emissions Allowances
  - To Agriculture and Forestry Projects.
    - 5% each year from 2012 to 2050.
    - For use in reducing GHG emissions, and increasing GHG sequestration, from the agriculture and forestry sectors.
    - Distribution to entities that carry out sequestration projects on agricultural and forest land.

Lieberman/Warner

- Auction and Use of Auction Proceeds
  - All EAs allocated to the Climate Change Credit Corporation must be auctioned off.
  - The proceeds from the Early Allocation are used entirely for energy technology programs. These are financial incentives in support for:
    - production of electricity from new zero or low-carbon generation.
    - manufacture of high efficiency consumer products.
    - demonstration projects using advanced coal generation technology.
    - deployment of advanced coal generation technologies.
    - large-scale geological carbon storage projects.
    - production of transportation fuel from cellulosic biomass.
    - production of advanced technology vehicles.

Lieberman/Warner

- Auction and Use of Auction Proceeds
  - The proceeds from annual allocations are to be used:
    - 55% for energy technology programs.
    - 20% to the Energy Assistance Fund.
    - 5% to the Climate Change Worker Training Fund.
    - 20% to the Adaptation Fund.

Lieberman/Warner

- International Reserve Allowance Program.
  - EPA directed to establish program.
  - Begins January 1, 2020.
  - US importers of Covered Goods from non-de minimis countries that have not taken comparable efforts to limit GHG emissions must purchase International Reserve Allowances for the Covered Goods imported.

Lieberman/Warner

- International Reserve Allowance Program
  - Covered Good
    - Primary Product
    - Generates in manufacture a substantial quantity of GHG emissions.
    - Is closely related to a good, the cost of production of which in the US is affected by ACSA.
  - Primary Product
    - Iron, steel, aluminum, cement, bulk glass or paper or
    - Any other manufactured product sold in bulk for further manufacture, and that generates in manufacture GHG emissions comparable to those generated by manufacture of products by Covered Facilities in the Industrial Sector.

Lieberman/Warner

- Framework for Geological Sequestration
  - Amend SDWA to direct EPA to issue regulations for permitting commercial-scale injection of carbon dioxide.
  - Regulations are to include provisions:
    - For monitoring and controlling long-term storage.
    - For avoiding release to the atmosphere.
    - Ensuring protection of underground sources of drinking water, human health and the environment.
    - Relating to long-term liability.

Lieberman/Warner

- Framework for Geological Sequestration
  - Directs DOI to conduct national assessment of storage capacity.
  - Directs DOE to assess feasibility of pipeline construction and construction of sequestration facilities.
  - EPA must assess implications of federal assumption of liability.

Lieberman/Warner

- SEC directed to adopt regulations requiring each issuer of securities to inform investors of material risks related to:
  - Financial exposure of issuer because of net emissions of issuer.
  - Potential economic impacts of global warming on the interests of the issuer.
- Citizen suit enforcement.
- States may adopt requirements as long as not less stringent.

McCain/Lieberman

- Regulates 6 GHGs.
- Applies to entities in the following sectors that emit over 10,000 metric tons/year.
  - Industrial
  - Commercial
  - Electric power
- Applies to refiners/importers of petroleum products for use in transportation that when used will emit over 10,000 metric tons/year.
- Applies to producers/importers of certain non-fuel chemicals that when used will emit over 10,000 metric tons/year.

McCain/Lieberman

- Reporting. Each Covered Entity must annually report its emissions from the preceding year to the National Greenhouse Gas Database.
- A Covered Entity may register with the Database reductions in emissions achieved between 1990 and 2012.
  - Must establish baseline and submit report for approval.
  - Non-Covered Entity may register reductions.

McCain/Lieberman

- Each Covered Entity must annually submit one Tradable Allowance for each metric ton of GHGs emitted during the prior year.
- No requirement to submit TAs for emissions deposited in approved geological storage facility.
- Must submit TAs for leakage from storage facilities.

McCain/Lieberman

- Total TAs set forth in Bill. Declines every year.
- TAs are allocated to Covered Entities at no charge.
- EPA must determine allocation of TAs to each sector, and to each Covered Entity within each sector.
- EPA must allocate TAs to Covered Entities equal to amount of GHG reductions registered by that entity.
- EPA must also determine the amount of TAs to allocate to Climate Change Credit Corporation, which will then sell the TAs to support technology development, adaptation assistance and other efforts.

McCain/Lieberman

- TAs may be used, sold, purchased or banked for future use.
- A Covered Entity may purchase/sell TAs to or from a Covered Entity in another sector.
- A Covered Entity may use purchased TAs to meet its requirement to submit sufficient TAs to cover its GHG emissions.

McCain/Lieberman

- A Covered Entity may borrow TAs from up to 5 years in the future.
- Borrowed TAs may be used to satisfy up to 25% of the current requirement.
- Must be paid back in 5 years with 10% interest.

McCain/Lieberman

- A Covered Entity may obtain TAs to satisfy up to 30% of its requirement with Domestic Offsets (4 types):
  - Tradable Allowances from another nation's market. Nation must have limits on emissions. (EPA must determine that market is completely accurate and transparent.)

McCain/Lieberman

- Registered Net Increase in Sequestration
  - Includes agricultural and conservation practices, reforestation, forest preservation.
  - Covered Entity must submit information every five years showing that net increase in sequestration still exists.
  - Unless EPA determines that the net increase still exists, the Covered Entity must submit additional TAs to offset the loss in sequestration.

McCain/Lieberman

- GHG emission reductions registered in the database by a non-covered entity.
- Credits obtained under the International Credit Plan.
  - Allows Covered Entities to earn TAs by undertaking EPA approved projects to reduce emission in developing countries.
  - Project must obtain independent third-party verifications that it produced real, measurable and long-term benefits and is in addition to reductions that would have occurred anyway.

EU ETS

- Part of EU's efforts to meet its obligation under the Kyoto Protocol.
- Includes 27 EU member countries.
- Australia, Belgium, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latria, Lithuanian, Luxemburg, Malta, Netherlands, Poland, Portugal, Slavik Republic, Slovenia, Spain, Sweden, the United Kingdom, Bulgaria and Romania.

EU ETS

- October 13, 2003. Directive of the European Parliament establishes EU ETS.
- Phase 1. First trading period. 2005-2007.
- Phase 2. Second trading period. 2008-2012.
- Covers oil refineries, power plants over 20 megawatts in capacity, coke ovens, iron and steel plants, and cement, glass, lime, brick, ceramics, and pulp and paper installations.
- Covers carbon dioxide.

EU ETS

- Emissions allowances are allocated to regulated facilities.
- 95% must be allocated free of change in Phase 1. 5% may be auctioned. In Phase 2, 10% may be auctioned.
- Allowances may be sold, purchased, or banked. In effect, banking is not allowed from one trading period to the next.

EU ETS

- Opt in Rule – allows a country to expand the scope of the EU ETS beyond the above-mentioned GHGs and sectors. For example, France and the Netherlands used the opt-in provision to include N_2O emissions from the production of fertilizers from 2008.
- Each facility must monitor emissions. Annual reporting of emissions is required. Must be verified by a third party.
- Each year, facilities must submit a sufficient number of allowances to cover emissions.

EU ETS

- Directive allows regulated entities to use JI or CDM credits toward fulfilling a portion of their commitments.
- Must be consistent with member State's commitment to supplementary.
- Commission's general rule for proportion allowed to be JI and CDM – 10%.

EU ETS

- National Allocation Plan
  - Each country must prepare and submit to the Commission for approval.
  - The plan sets forth the total allowances that will be issued for the period.
  - The plan sets forth the number of allowances that each facility will be allocated for the period.
  - The plan sets forth other policies and measures that a country will take to meet Kyoto requirements.

EU ETS

- National Allocation Plan
  - Plan must set forth how many credits from JI and CDM regulated facilities are allowed to use for compliance.
  - NAPs for the Second Trading Period were required to be submitted by June 30, 2006.
  - Problem of over allocation in Phase 1.

EU ETS

- 1/23/08. EU Commission proposal for overhaul of EU ETS for 3rd trading period beginning in 2012. (must now go to EU Parliament and EU Council)
  - Single EU cap. Scrap NAPs.
  - Increase auctioning.
  - Extend to aluminum and ammonia producers, and to nitrous oxide and perfluorocarbons.

Regulation Under CAA

- Omnibus Appropriations Bill. Signed by the President December 26, 2007.
- Directs EPA to prepare a rule requiring reporting of GHG emissions above certain thresholds in all sectors of the U.S. economy.
- EPA is to use existing authority under the CAA.
- Propose a rule within 9 months. Issue a final rule within 18 months.

Regulation Under CAA

- Motor Vehicles
  - Massachusetts v. EPA. Carbon dioxide is an air pollutant. Must make endangerment determination.
  - Executive Order requiring motor vehicle rule.
  - Energy legislation setting CAFÉ and fuel standards.
  - Denial of California waiver request.
  - Agency considering impact of energy legislation.

Regulation Under CAA

- Motor vehicles
  - Denial of California Waiver Request.
    - Hearings in Congress.
    - California and 15 others sue EPA 1/2/08.
    - Arizona proposed Rule adopting California standards. 1/10/08.

Regulation Under CAA

- NAAQS
  - Petition denied. Litigation commenced.
  - States terminated the NAAQS lawsuit.
  - Section 108 (NAAQS) contains similar endangerment standard.
  - In denying petition, EPA sets forth how a NAAQS for carbon dioxide is impractical.
  - FIP option.

Regulation Under CAA

- NSPS
  - Section 111 contains similar endangerment standard.
  - States and environmental groups have challenged two NSPS for failure to set GHG standards.
    - Power plants and industrial boilers
    - Stayed pending outcome of Massachusetts v. EPA
    - Remanded to the agency
  - April 2007 - proposed NSPS for petroleum refineries. Received comments to set GHG standards. Final rule due 4/30/08.
  - EPA scheduled to propose NSPS revisions for Portland Cement kilns by 5/31/08.

Regulation Under CAA

- PSD
  - Is carbon dioxide "subject to regulation" under CAA? Recordkeeping and reporting requirements under Acid Rain Program.
  - EPA position – PSD and BACT do not apply until there is an actual GHG regulation concerning emissions.
  - On appeal to EAB.
  - What is BACT? IGCC?

Energy Independence and Security Act

- Signed 12/19/07
- Raise CAFE standards from 25 to 35 mpg by 2020 (beginning in 2011).
- Increase RFS to 9 billion gallons in 2008 and 36 billion gallons by 2022.
- New energy efficiency standards for appliances and lighting.
- Expanded federal research into carbon sequestration.

State and Regional Efforts to Address Climate Change

Mark Freeze, Special Counsel

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February 8, 2008

California Global Warming Solutions Act

- Signed on September 27, 2006.
- Purpose is to reduce GHG emissions in California.
- Promulgation of regulations to implement the program is delegated to CARB.
- Sets a series of timelines for regulations.
- Reduction measures go into effect January 1, 2012.
- Goal is to reduce emissions to 1990 levels by 2020.

California Global Warming Solutions Act

- By January 1, 2008, adopt regulations regarding reporting of emissions.
  - Require monitoring and annual reporting of emissions from sources.
  - Beginning with sources that contribute the most.
  - Account for GHG emissions from all electricity consumed in the State.
  - Review existing and proposed international, federal and state GHG reporting programs and make reasonable efforts to promote consistency and streamline reporting requirements.

California Global Warming Solutions Act

- By January 1, 2008 – Emissions Level.
  - Determine statewide GHG emission level in 1990.
  - Approve a GHG emissions limit equal to that level, to be achieved by 2020.
- By June 30, 2007. Discrete Early Action Items.
  - Publish a list of discrete early action GHG reduction measures that can be implemented.
  - By January 1, 2010, adopt regulations to implement the measures.

California Global Warming Solutions Act

- January 1, 2009. Scoping Plan.
  - Prepare and approve a scoping plan.
  - For achieving maximum technologically feasible and cost effective reductions by 2020.
  - Identify and make recommendations on:
    - Direct emission reduction measures
    - Alternative compliance mechanisms
    - Market-based compliance mechanisms
    - Potential monetary incentives
  - In developing plan, take into account relative contribution of each source or source category, and potential for adverse effects on small businesses.
  - Recommend a de minimis threshold below which emission reduction requirement will not apply.

California Global Warming Solutions Act

- By January 1, 2011. Implementing Regulations
  - Adopt emission reduction measures to achieve the maximum technologically feasible and cost effective reductions.
  - In adopting regulations, CARB shall:
    - Design regulations, including distribution of emissions allowance where appropriate, in a manner that is equitable.
    - Ensure entities that have voluntarily reduced emissions prior to implementation receive appropriate credits.
    - Consider cost effectiveness.
    - Minimize administrative burden of compliance.
    - Consider significance of contribution of each source or category of sources.

California Global Warming Solutions Act

- Implementing Regulations
  - May adopt market-based system with declining annual aggregate emission limits.
  - Any regulation adopted shall ensure:
    - Reductions are real, permanent, quantifiable, verifiable and enforceable.
    - For a market-based system, reductions must be in addition to those otherwise required by law, and those that would otherwise occur.

California Global Warming Solutions Act

- **Reporting Regulation**
  - October 19, 2007. CARB issues staff report and proposed regulation.
  - December 6, 2007. CARB conducts a public meeting. CARB adopted the proposed regulation with modifications.
  - The Executive Officer is directed to adopt the proposed regulations as modified, with such other conforming modifications as may be appropriate, after making the modified regulation available for public comment for 15 days (and making such additional modifications as are appropriate considering the comments).
  - It is anticipated that the revised version will be made available for comment in February 2008.

California Global Warming Solutions Act

- **Reporting Regulation**
  - **Facilities Required to Report GHG Emissions**
    - Electricity generating facilities
    - Electricity retail providers
    - Electric power marketers
    - Petroleum refineries
    - Hydrogen plants
    - Cement plants
    - Cogeneration facilities
    - Industrial sources that emit > 25,000 metric tons/year of CO_2 from general stationary combustion facilities
  - **Reporting is annual. First Emissions Report covers 2008 emissions. It is due in 2009 (either April 1 or June 1).**
  - **Regulations apply to those with operational control of the facility.**

California Global Warming Solutions Act

- Reporting Regulation
  - Facilities Specifically Excluded:
    - Electric generating facilities solely powered by nuclear, hydroelectric, solar energy or wind
    - Backup generators
    - Hospitals (with NAICS code starting with 62)
    - Primary and secondary schools (with NAICS code of 611110)
  - Reporting must use the methods, equations and emissions factors specified in the regulation.
  - CARB estimates approximately 800 facilities will be required to report.

California Global Warming Solutions Act

- Reporting Regulation
  - Provides specific reporting requirements for each industrial sector.
  - All facilities required to report their on-site stationary source combustion emissions of carbon dioxide, nitrous oxide, and methane.
  - Some industrial sectors, such as cement and refineries, would also report their process emissions, which occur from chemical or other non-combustion activities.
  - Those reporting must also provide their consumption of purchased or acquired electricity and thermal energy (indirect energy usage).

California Global Warming Solutions Act

- Reporting Regulation
  - Phase-in Time. First Reporting Year. Reporting and verification requirements less stringent.
  - Except for reports submitted in 2009, emissions reports must be verified by a third party.
  - Verification preformed annually or tri-annually, depending on the complexity of the source.
  - Could be done by private contractor. Must meet specified education, training and experience requirements.

California Global Warming Solutions Act

- Reporting Regulation
  - General Stationery Combustion Facilities.
    - Examples
      - Natural gas transmission
      - Paperboard manufacturer
      - Food processing
      - Steel foundries
      - Glass container
      - Mineral processes
    - Applies to approximately 150 facilities.
    - The 25,000 MT threshold is used in the EU reporting program.

California Global Warming Solutions Act

- Reporting Regulation
  - General Stationary Combustion Facilities.
    - Must report direct emissions from stationery combustion. (No requirement to report process emissions or fugitive emissions.)
    - Annual amount of fuel combusted will be multiplied by an emissions factor for each fuel type to yield direct emission of carbon dioxide, nitrous oxide, and methane (except crude oil and gas exploration and production sector).
    - Also report the Facility's purchased or acquired energy usage from electricity or thermal sources. Generally available from billing statements.

California Global Warming Solutions Act

- **Reporting Regulation**
  - Electricity Sector
    - Generating Units. Report if ≥ 1 MW and ≥ 2500 metric tons of carbon dioxide.
    - Generating Units. CEMs or fuel testing for direct emissions. Required to report CO_2 emissions following methodologies and protocols outlined in 40 CFR Part 75 (acid rain program).
    - Must report process and fugitive emissions. (CO_2 process emissions from acid gas scrubbers, fugitive CO_2 emissions from geothermal power, emissions from coal storage, HFCs from generator cooling units, and SF_6 emissions from facility equipment).
    - Retail providers and power marketers must provide purchase, sale, import and export information. Must report fugitive SF_6 related to transmission and distribution systems they maintain.

California Global Warming Solutions Act

- 1990 Emissions Level and 2020 Emissions Limit.
  - November 16, 2007. Staff report.
  - Recommend Board approve 427 million metric tons of carbon dioxide equivalent.
  - Public meeting December 6, 2007.
  - CARB approves recommendation.

California Global Warming Solutions Act

- Early Action Items
  - On June 21, 2007 CARB approved 3 Discrete Early Action Items and 34 Early Action Items.
  - On October 25, 2007, CARB approved an additional 2 Discrete Early Action Items and 5 Early Action Items. It also reclassified 4 Early Action Items as Discrete Early Action Items.
  - Discrete Early Action Item – measures to be adopted as regulations and made effective by January 1, 2010.
  - Early Action Item – reduction measure underway or to be initiated in the 2007-2012 timeframe. May be regulatory or non-regulatory.

California Global Warming Solutions Act

- Discrete Early Action Items:
  - Low carbon fuel standard
  - Restrictions on high global warming potential refrigerants
  - Landfill methane capture
  - SF_6 reductions in the non-electric sector
  - Reduction of high GWP, GHGs in consumer products
  - SmartWay truck efficiency
  - Tire Inflation Program
  - Reduction of PFCs from the semiconductor industry
  - Green ports

California Global Warming Solutions Act

- Early Action Items include:
  - Manure management protocol
  - Research re GHG reductions from nitrogen land application
  - Electrification of stationary agricultural engines
  - Reduction of SF_6 in electricity generation
  - Specifications for commercial refrigeration
  - Reduction of venting/leaks from oil and gas systems
  - Anti-idling enforcement
  - Evaporative standards for above ground tanks

California Global Warming Solutions Act

- Scoping Plan
  - Will contain the main strategies that California will use to reduce GHG emissions.
  - Draft scoping plan will be released for public comment in June 2008.
  - Plan will go to the Board for adoption in November 2008.

New Mexico Reporting Rule

- Proposed rulemaking to go into effect January 1, 2008.
- Power plants, oil and gas refineries and cement plants would be among the first industries affected.
- Largest industrial facilities would have to begin reporting GHG emission annually for 2008.
- Smaller-sized industrial facilities, or Title 5 sources that emit more than 100 tpy of criteria pollutants, would be required to report in 2009.
- There is a phase-in of gases to be reported, starting with carbon dioxide.

Western Climate Initiative

- Formed February 26, 2007. Washington, Oregon, Arizona, New Mexico and California.
- Purpose of the Initiative is to collaborate in identifying, evaluating and implementing ways to reduce GHG emissions.
- Spring 2007. British Columbia, Manitoba and Utah joined the Initiative.

Western Climate Initiative

- August 22, 2007. Statement of Regional Goal. 15% below 2005 levels by 2020.
- All partners join the Climate Registry.
- By August 2008, the partners will design a regional market-based multi-sector mechanism, to help achieve the goal.
- October 29, 2007. Western Climate Initiative Work Plan describes the process for developing the design recommendations for a cap and trade program.
  - Five subcommittees are formed to identify options and provide recommendations:
    - Reporting
    - Scope
    - Electricity
    - Allocations
    - Offsets
  - A series of workshops and teleconferences are set up for public input.

Western Climate Initiative

- January 2-3, 2008. The five subcommittees each issue a paper describing the options they have under consideration.
- January 10, 2008. Stakeholder Workshop. Presentation and discussion of options under consideration.
- May 21, 2008. Workshop. Subcommittees will present their recommendations on key elements of the cap and trade program.
- July 2008. Partners will present the preferred fully integrated plan for consideration and public input.
- Goal is a Memorandum of Agreement.

Western Climate Initiative

- Some issues under consideration:
  - Sectors, sources and GHGs that fall under the cap.
  - Threshold for regulation.
  - Allowances distributed free of charge or by auction.
  - Banking and/or borrowing of allowances.
  - Incentives for early action.
  - Apportionment of allowances among the jurisdictions (or centralized).
  - Distribution of allowances among sectors and covered entities (standardized or not).

Western Climate Initiative

- Some issues under consideration:
  - Entities required to report.
  - Date reporting requirement commences.
  - Entity reported to.
  - Third party verification of reporting.
  - Offsets as a compliance mechanism.
  - Geographic location for allowed offsets.
  - Limits on the use of offsets.

Western Climate Initiative

- Design elements that appear to be feasible to include in a cap and trade program in the near term, based on preliminary analysis:
  - Electric sector
  - Large stationary combustion sources
  - Liquid transportation fuels (at point that fuel enters commerce)
  - Residential and commercial natural gas combustion (at the local natural gas distribution company)
  - Residential and commercial stationary combustion of fuel oil and other liquid fuels (at the point that fuel enters commerce)
  - Industrial process and waste management emissions

Western Climate Initiative

- Design elements not likely to be feasible to be included under the cap and trade program in the near term, based on preliminary analysis:
  - Emission sources at fossil fuel production facilities for which it is difficult to measure emissions
  - Passenger cars and light duty trucks (at the point of manufacture)
  - Large transportation fleets
  - Agricultural emissions and sinks
  - Forestry emissions and sinks
  - High GWP gases (at the point of manufacture)

Midwest GHG Reduction Accord

- Signed by six States and Manitoba on November 15, 2007.
- Wisconsin, Minnesota, Illinois, Iowa, Michigan, Kansas and Manitoba.
- Indiana, Ohio and South Dakota signed as observers.

Midwest GHG Reduction Accord

- To establish a GHG emissions target.
- To develop a market-based multi-sector cap and trade mechanism to help achieve those targets.
- Develop an agreement and model regulation within 12 months.
- Full implementation within 30 months.

Northeast RGGI

- A cooperative effort by 10 states to implement a regional cap and trade program covering carbon dioxide emissions from power plants.
- In the future, RGGI may be extended to include other sources of GHG emissions and other GHGs.
- Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, Vermont, Massachusetts, Rhode Island, and Maryland.

Northeast RGGI

- MOU signed – December 20, 2005.
- Model Rule finalized – August 15, 2006.
- The Model Rule forms the basis of individual state regulatory and/or statutory proposals to implement the program.
- Requirements are to go into effect on January 1, 2009.

Northeast RGGI

- Applicability
  - Fossil Fuel fired electric generating units serving a generator of 25 MW or larger.
- Definition of Fossil Fuel Units
  - For those commencing operation after 1/01/05, if fossil fuel comprises more than 5% of total annual heat input.
  - For those commencing operation prior to 1/01/05, if fossil fuel comprises more than 50% of total annual heat input.
- Carbon dioxide emissions attributable to eligible biomass can be deducted from that unit's compliance obligation.

Northeast RGGI

For first six years, CAP is set at 188 million short tons. Roughly at current emission level (2009-2014).

- CAP declines 2.5% per year from 2015-2018, for a total reduction of 10%.
- MOU apportions the CAP among the member states through a process that was based on historical emissions and negotiation.

Northeast RGGI

- Allowances may be allocated for free or auctioned off.
- Minimum of 25% must be auctioned to support consumer benefit programs.
- Most states intend to auction 100% or nearly 100% of their allowance to support consumer benefit programs.

Northeast RGGI

- Early Reduction Allowances
  - Awards allowances directly to the source for qualifying emissions reductions made before the program start date.
  - Not included in the auction.
  - Not included in the CAP.
  - Reduction must occur during the three-year reduction period of 2005-2008.
  - Reduction must be relative to three-year baseline period of 2003-2005.

Northeast RGGI

- Flexibility Mechanisms
  - Allowances may be bought and sold.
  - Unrestricted banking of allowances.
  - Three-year compliance period. Four-year compliance period in the event of a stage-two trigger event.
  - No borrowing of allowances.

Northeast RGGI

- Price triggers
  - Stage One trigger event – 12-month rolling average allowance price exceeds $7.
    - May expand use of offset allowances from 3.3% to 5%.
  - Stage Two trigger event – 12-month rolling average allowance price exceeds $10.
    - May expand use of offset allowances to 10%.
    - Compliance period extended to 4 years.
    - May award allowances for permanent retirement of allowances/credits issued by program outside of US.
  - 14 month market settling period at beginning of each new compliance period.

Northeast RGGI

Offsets

- Allowances may be awarded to projects outside the capped sector that reduce and/or sequester emissions.
- May be used to satisfy up to 3.3% of a total compliance obligation.
- Reductions must be real, verifiable, additional, enforceable and permanent.
- At this time, only 5 project categories are eligible:
  - Landfill methane capture
  - Afforestation
  - Agricultural manure management operations
  - Reduction of carbon emissions from natural gas, oil or propane end-use combustion due to end-use energy efficiency in the building sector.

Environmental Litigation Relating to the Alleged Effects of Climate Change

David Nelson, Special Counsel

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February 8, 2008

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **To the Extent Climate Change Causes Negative Effects, What Types of Litigation Are Most Likely to Ensue?**
  - **Scientific Studies That Plaintiffs May Use to Support a Cause of Action.**
  - **Existing Causes of Action Under Federal Environmental Laws.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Current Evidence Establishing Causation:**
  - **Expert Scientific Studies Exist to Support Both Negative and Positive Impacts, Setting Up a Battle of the Experts in Related Litigation.**
  - **But Studies Suggest Greater Uncertainty in Predicting Impact on a Regional vs. Global Scale, Requiring Local Opinions to Support Litigation.**
  - **Existing Studies Forecast More Severe Impact If Climate Change Increases Temperatures By More Than 5 ^{o} F.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Recent Studies Plaintiffs May Use to Link Climate Change to Negative Impact:**
  - **Intergovernmental Panel on Climate Change (IPCC), established by the World Meteorological Association and the United Nations Environment Programme:**
    - ***Climate Change 2007: Impacts Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report*** **(2007)**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **IPCC's Fourth Assessment Report (2007)**
  - Assessed:

    "the current scientific understanding of the impacts of climate change on natural, managed and human systems, the capacity of these systems to adapt and their vulnerability."

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Conclusions of IPCC's Fourth Assessment Report (2007)**
  - High Confidence in Assessments that Show an Impact on Snow, Ice and Frozen Ground:
    - *Shrinking Glaciers and Larger Glacial Lakes*
    - *More Unstable Permafrost Regions*
    - *More Rock Slides in Mountainous Regions*
    - *Changing Arctic Ecosystems*

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **IPCC's Fourth Assessment Report (2007)**
  - High Confidence in Assessments that Show Impact on Other Hydrological Systems:
    - *Increased Runoff and Earlier Peak Discharge of Snowmelt into Rivers*
    - *Warmer Lakes and Rivers, with Associated Effects on Water Quality*

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **IPCC's Fourth Assessment Report (2007)**
  - High Confidence in Assessments that Show Impact on Marine and Freshwater Species:
    - *Algal and Zooplankton Abundance in High-Latitude Oceans.*
    - *Changes in Fish Migration and Earlier Migration in Rivers and Streams.*

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **IPCC's Fourth Assessment Report (2007)**
  - Very High Confidence that warming is strongly impacting terrestrial biological systems and species:
    - *Earlier Timing of Spring Events, such as Leaf-unfolding, Bird Migration and Egg-laying.*
    - *Poleward and Upward Shifts in Ranges in Plant and Animal Species.*

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **IPCC's Fourth Assessment Report (2007)**
  - **Observations for Arid Regions, such as Arizona**:
    - ***Earlier Spring Planting, but Increased Disturbance of Forests Due to Fire and Pests.***
    - ***Increased Heat-Related Mortality.***
    - ***Greater Frequency of Infectious Disease and Higher Levels of Allergenic Pollen.***
    - ***Decrease in Average River Runoff by as much as 10-30% in Dry Regions.***
    - ***Increased Cardio-respiratory Disease In Certain Areas Due to Ground-Level Ozone.***

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Pew Center on Global Climate Change, *A Synthesis of Potential Climate Change Impacts on the U.S.* (2004):**
  - *The southern United States appears more vulnerable.*
  - *Studies agree on impact on forests, infectious disease, and infrastructure, with negative impacts increasing in the later half of the 21st Century.*

Environmental Litigation Relating to the Alleged Effects of Climate Change

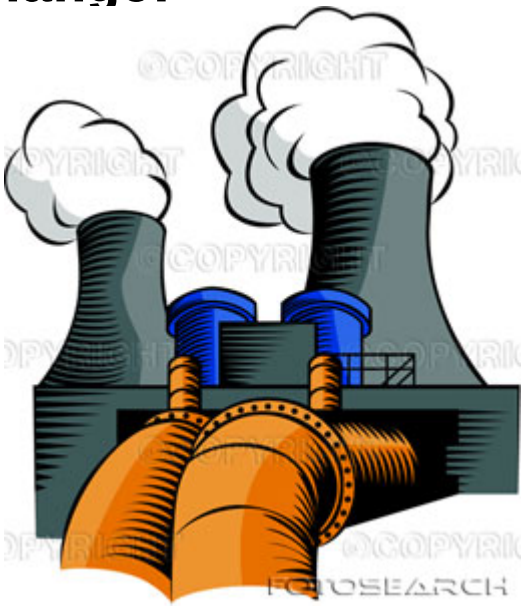
- **Pew Center Report (2004):**
  - **Impact on Arid Regions, Such as Arizona**:
    - ***Agreement with IPCC on the negative impact on forests due to fire and pests.***
    - ***Increased heat-related mortality for those with lower income, due to cooling costs.***
    - ***Possible impacts on tourism and recreation.***
    - ***More frequent and intense floods and droughts.***
    - ***Increased costs for infrastructure and political repercussions due to changing water laws and arrangements governing water resources.***

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Pew Center Report (2004):**
  - **Notes Disagreement on the Likelihood of Negative Impacts on Specific Regions**:
    - ***Some studies predict net economic benefits for agriculture if warming trends remain less than 4-7° F .***
    - ***There is greater uncertainty in predicting the impact on precipitation, such as el Nino effects.***
    - ***The long-run and ultimate effects of CO_2 on biomass are uncertain.***
    - ***In general, "We are not yet able to predict the exact impacts on climate change."***

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Establishing Causation:**
  - **Further Challenges Exist in Showing Any Specific Source Is Causing Climate Change:**

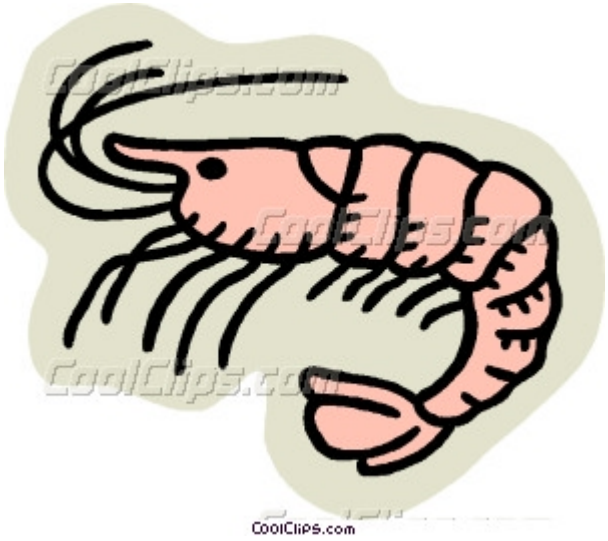


Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Getting Into Court Using Federal Environmental Laws and Citizen Suit Provisions.**
  - **ESA, 16 U.S.C.§ 1531, et. seq.**
  - **Clean Air Act, 42 U.S.C. § 7401, et. seq.**
  - **CERCLA, 42 U.S.C. § 9601 , et. seq.**
  - **RCRA, 42 U.S.C. § 6901, et. seq.**
  - **SDWA, 42 U.S.C. § 300f, et. seq.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From the Increased Risk of Species Extinction:**
  - **Endangered Species Act, 16 U.S.C.§ 1531, et. seq.**



Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Endangered Species Act:**
  - **The Act has four major components, any one of which may give rise to litigation:**
    - **(1) Listing;**
    - **(2) Consultation;**
    - **(3) Prohibitions on Takings; and**
    - **(4) Incidental Takings Permits.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Endangered Species Act:**
  - **Section 4 of the Act requires USFWS determine whether a species is endangered or threatened.**
  - **Section 7 of the Act provides that every federal agency, in consultation with USFWS, insure that any agency action is not likely to jeopardize the continued existence of a threatened or endangered species.**
    - Example – ACOE needs to consult with USFWS when granting a dredge and fill permit under Section 404 of the Clean Water Act.

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Endangered Species Act:**
  - **Section 9 of the Act makes it unlawful for any person to "take" a listed species, which includes impacting the habitat of the species.**
  - **The USFWS may issue an "incidental take permit" authorizing certain harmful activities, but in order to obtain such a permit, a person must apply for a permit and submit a Habitat Conservation Plan to the USFWS, which is subject to public comment.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Endangered Species Act:**
  - The ESA citizen suit provision allows any person to bring suit to enjoin any person (including the United States) who is alleged to be in violation of the Act. 16 U.S.C. §1540(g)(1)(A).
  - Citizen suits are also allowed to compel the USFWS to perform any non-discretionary act or duty with regard to the listing of endangered or threatened species and critical habitats. 16 U.S.C. §1540(g)(1)(C).

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Endangered Species Act:**
  - *Bennett v. Spear,* 520 U.S. 154 (1997):
    - Involved the Klamath Project in Oregon and California, and man-made reservoirs containing endangered fish.
    - Pursuant to the ESA, the Bureau of Reclamation held that certain water levels must be maintained to protect the fish habitat, thus limiting water released for irrigation.
    - Nearby Ranchers appealed, arguing that the Bureau failed to consider the economic impact on farming and livestock that relied on irrigation water previously supplied.
    - Initially, the trial court dismissed the case, and the Ninth Circuit affirmed, holding that the ranchers lacked standing because only citizens seeking to preserve species may bring a ESA citizen suit.

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Endangered Species Act:**
  - *Bennett v. Spear,* 520 U.S. 154 (1997):
    - On Appeal to the U.S. Supreme Court, the Ninth Circuit overturned – under the ESA, "any person" may bring suit, even for over-enforcement.
    - The ranchers stated a claim, because ESA § 1533(b)(2) mandates that an ESA designation consider economic impact, and the Bureau failed to consider the impact on irrigation water.

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Endangered Species Act:**
  - *Bennett v. Spear,* 520 U.S. 154 (1997):
    - Affirms broad standing to bring citizen suits under the ESA for both those seeking to protect species and those impacted negatively by such administrative decisions.
    - Typifies lawsuits that may become more frequent as climate change increases drought conditions, impacting fish habitat in both man-made and natural bodies of water needed for farming and industry.

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From the Increased Concentrations of Ozone:**
  - **Clean Air Act, 42 U.S.C. § 7401, et. seq.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

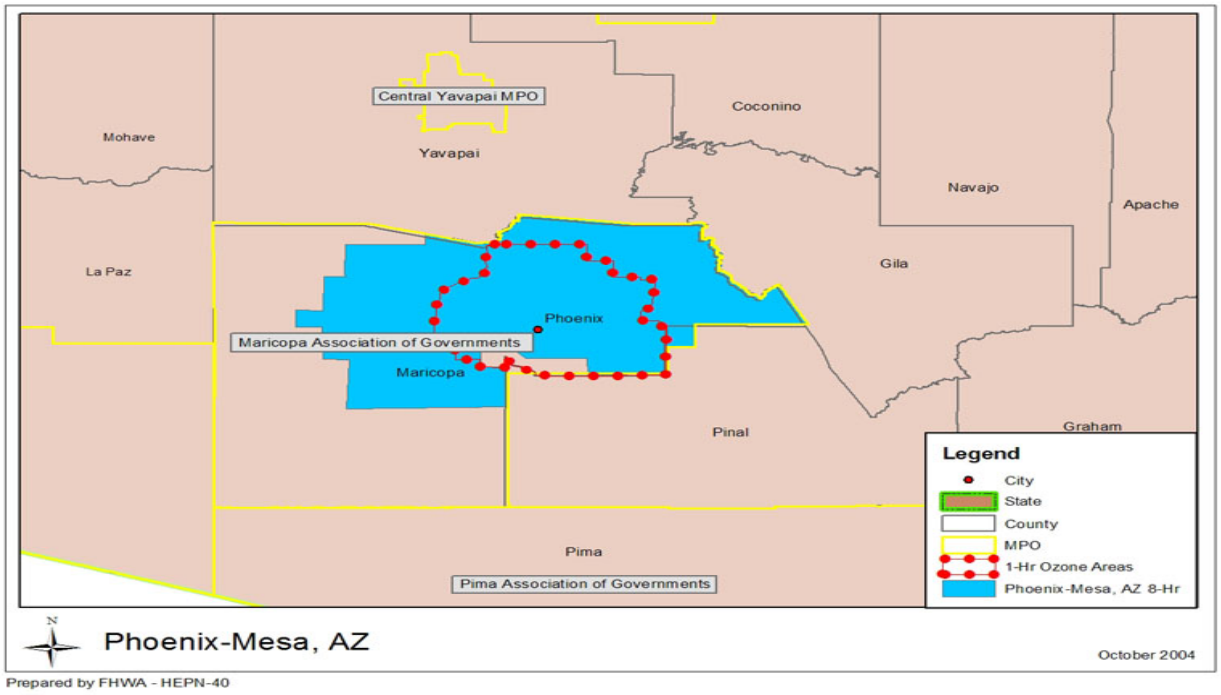
- **Clean Air Act, 42 U.S.C. § 7401, et. seq.**
  - **Under the Clean Air Act, the United States Environmental Protection Agency ("USEPA") must issue National Ambient Air Quality Standards ("NAAQS") for those air pollutants that it deems widespread and harmful.**
  - **Scientific studies predict that warmer temperatures brought on by climate change will likely lead to higher concentrations of ground-level ozone.**
  - **NAAQS have been set for ozone, and increased concentrations of ground-level ozone trigger increased air quality regulation for non-attainment areas.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Clean Air Act, 42 U.S.C. § 7401, et. seq.**
  - **The current NAAQS for ozone is .08 parts per million, averaged over eight hours. 40 C.F.R. §50.10.**
  - **But in 2007, the USEPA proposed lowering the ozone standard to between .070 and .075 parts per million. 72 Fed. Reg 37818 (July 11, 2007).**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Clean Air Act, 42 U.S.C. § 7401, et. seq.**



Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Clean Air Act, 42 U.S.C. § 7401, et. seq.**
  - **January 2008 - New State Rulemaking and Litigation Are Already Underway:**
    - **ADEQ Issues Draft Clean-Car Rules to Cut Greenhouse Gas Emissions from Vehicles.**
    - **Attorney General Goddard, ADEQ Director Owens Sue EPA in Battle for States' Right to Fight Global Warming.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From Decreased Water Supplies:**
  - **CERCLA, 42 U.S.C. § 9601 , et. seq.**
    - **Provides that one who incurs costs in cleaning up hazardous substance contamination may bring an action to recover those costs. 42 U.S.C. §9607.**
      - **Example: groundwater cleanup needed to replenish water supplies.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From Decreased Water Supplies: CERCLA, 42 U.S.C. § 9601 , et. seq.**
  - ***United States v. Atlantic Research Corporation*, 127 S. Ct. 2331 (2007).**
    - Opens the door for non-governmental plaintiffs, who are responsible for some of the contamination, to bring a claim under CERCLA without first being sued by the government.
    - Creates a mechanism to demand cost sharing among potentially responsible parties who contributed to the contamination of drinking water supplies needed due to climate change and increasing drought conditions.

Environmental Litigation Relating to the Alleged Effects of Climate Change

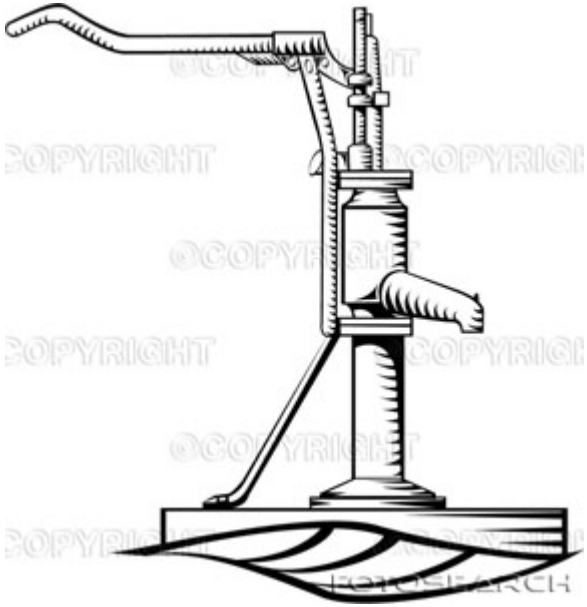
- **Environmental Litigation Resulting From Decreased Water Supplies:**
  - **RCRA, 42 U.S.C. § 6901, et. seq.**
    - **Provides plaintiffs with a citizen suit provision to halt the threat of an imminent and substantial endangerment to human health and the environment from hazardous wastes. 42 U.S.C. §6972(a)(1)(B).**
      - **Example - groundwater impacted by hydrocarbons that leak from underground storage tanks that impact water supplies.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From Decreased Water Supplies:**
  - **RCRA Citizen Suits, 42 U.S.C. § 6972(a)(1)(B):**
    - **Allows standing where there is a "threat" to human health and the environment, a lower threshold of proof than finding hazardous waste is causing injury or damage presently.**
    - **Limitation: Does not provide for cost recovery and damages, only injunctive relief.**
    - **But does allow recovery of plaintiff's attorneys fees if successful.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From Decreased Water Supplies:**
  - **SDWA, 42 U.S.C. § 300f, et. seq.**



Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From Decreased Water Supplies:**
  - **SDWA, 42 U.S.C. § 300f, et. seq.**
    - **Establishes Maximum Contaminant Levels (MCLs) for drinking water supplies.**
    - **Includes a Citizen Suit provision for the violation of MCLs, 42 U.S.C. § 300j-8.**
    - **Allows Recovery of Attorneys and Expert Witness Fees.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Environmental Litigation Resulting From Decreased Water Supplies - SDWA.**
  - **Drought conditions increase the need to use less than pristine drinking water supplies that exceed MCLs.**
  - **Higher temperatures increase the growth rates and survival of bacteria, such as e coli, and human parasites living on e coli.**
  - **Water system infrastructure in many areas of the U.S. is in need of replacement, which will exacerbate the impact of warmer temperatures.**

Environmental Litigation Relating to the Alleged Effects of Climate Change

- **Conclusions**:
  - With the current focus on global warming and climate change, peer-reviewed scientific studies are being generated that provide the evidence needed to link sources of climate change to specific negative impacts, one of the elements needed to bring a lawsuit.
  - Federal environmental statutes already provide standing to plaintiffs to get into court, awarding attorneys fees and expert witness costs if the negative impact based on climate change can be shown.
  - If temperatures continue to increase, the impacts are likely to become more widespread and, accordingly, evidence of negative impacts more conclusive on a regional level.

Environmental Litigation Resulting from Efforts to Address Climate Change

Mark Freeze, Special Counsel

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www.steptoe.com

February 8, 2008

Litigation Resulting from Adoption of Limits on GHGs

- Each major bill is a cap and trade bill.
- Similar to the Acid Rain Program under the Clean Air Act.
- Bills differ mainly in the scope of entities regulated and the amount of reductions required.

Litigation Resulting from Adoption of Limits on GHGs

- Programs involve the allocation of emission allowances to regulated entities.
- There will likely be litigation between regulated entities and the agency regarding the process of allocating emissions.
- This issue has been the subject of litigation in the Clean Air Act's Acid Rain Program.

Litigation Resulting from Adoption of Limits on GHGs

- Indianapolis Power and Light v. USEPA, 58 F.3d 643 (D.C. Cir. 1995).
  - Acid Rain Program provides that utilities that opt to install sulfur dioxide scrubbers are entitled to extension allowances in addition to allowances otherwise allocated.
  - Number of allowances = lesser of expected emissions for 95/96 less maximum emissions, actual emissions in 88/89 less maximum emissions.
  - IPL's unit was out of operation from 10/88 to 4/89. EPA regulations did not allow adjustment to what emissions would have been without the outage.
  - IPL sued and argued that the statute required an adjustment, or, if the statute is silent, EPA's exercise of its discretion was unreasonable.
  - Court upheld regulation as a reasonable exercise of EPA's discretion.

Litigation Resulting from Adoption of Limits on GHGs

- Madison Gas and Electric v. USEPA, 25 F.3d 526 (7th Cir. 1984)
  - Utility challenged EPA's failure to allocate it bonus allowances based on a generating capacity that exceeded 250 megawatts.
  - Issue was whether aggregate capacity could include two plants of which utility was 22% owner.

Litigation Resulting from Adoption of Limits on GHGs

- Texas Municipal Power Agency v. EPA, 89 F.3d 858 (D.C. Cir. 1996)
  - Allowances allocated based on past emissions for 1985-1987.
  - Baseline (average annual fuel consumed during 1985-1987) x plant's actual emissions rate for 1985.
  - Utility challenged EPA calculation of allowances based on emission rate calculated using average sulfur content of fuel burned by all utilities in the State in 1985.

Litigation Resulting from Adoption of Limits on GHGs

- Programs involve the purchase and sale of emissions allowances.
- There will likely be litigation concerning the transfer of allowances, or concerning the regulations governing such transfers.
- American Municipal Power of Ohio v. EPA, 98 F.3d 1372 (D.C. 1996).
  - Smaller utilities allowed to opt in to Acid Rain Program and receive allowances.
  - Opt-ins that reduce their emissions are allowed to sell their unused allowances.
  - Opt-ins that shut down may not transfer unused allowance unless the transfer falls within a narrow exception.
  - Utility challenged EPA's determination that it was not eligible for the exception.

Litigation Resulting from Adoption of Limits on GHGs

- There will likely be litigation concerning agency approval or disapproval of the following:
  - Projects undertaken to reduce emissions.
  - Use of emissions allowances from a foreign GHG market.
  - Early reduction efforts.
  - Carbon capture and sequestration projects.

Litigation Resulting from Adoption of Limits on GHGs

- Agency enforcement.
- Citizen suit enforcement.
- Private party litigation arising out of contract disputes in the purchase and sale of emissions allowances.

Litigation Resulting from State and Regional Efforts

- Will likely lead to constitutional challenges based on: 1) the Commerce Clause; 2) the Supremacy Clause; and 3) the doctrine of foreign policy pre-exemption.
- California's efforts to regulate GHG emissions from automobiles has generated litigation raising all three. See Central Valley Chrysler-Jeep v. Witherspoon, 456 F. Supp. 2d 1160 (E.D. Cal. 2006).

Litigation Resulting from State and Regional Efforts

- The Commerce Clause – limits the power of the States to adopt laws that interfere with interstate commerce.
  - State laws that facially discriminate against interstate commerce are virtually per se invalid.
  - If the law does not facially discriminate, it is still invalid if the burden the law places on interstate commerce is clearly excessive in relation to the local benefits.

Litigation Resulting from State and Regional Efforts

- Commerce Clause
  - Not clear at this point where the issues will be, but they could involve efforts to address:
    - Leakage
    - Competitiveness
  - Potential litigants will likely argue that the interests of the State or Region is not great because emissions reductions by any State or Region are inconsequential.

Litigation Resulting from State and Regional Efforts

- Supremacy Clause – "This Constitution and the Laws of the United States which shall be made in pursuance thereof . . . shall be the supreme law of the land; . . . any thing in the Constitution or the laws of any State to the contrary notwithstanding."
  - A federal statute may expressly preempt state law.
  - Even absent express preemption, the federal statute may indicate an intent to occupy an entire field of regulation.
  - Where compliance with both state and federal law is impossible, or where the state law stands as an obstacle to accomplishment of the full purposes and objectives of Congress.

Litigation Resulting from State and Regional Efforts

- Clean Air Act does expressly preempt States from regulating emissions from motor vehicles without a waiver.
- Energy Policy and Conservation Act, which sets fuel economy standards for motor vehicles.
- CAA should not preempt State regulation of stationary sources. Act stated there is no prohibition against a State's regulating air pollution.
- Warner/Liebermann expressly states that it does not preempt more stringent State standards.

Litigation Resulting from State and Regional Efforts

- Doctrine of Foreign Policy Preemption
  - Constitution vests President with vast share of responsibility for the conduct of foreign relations.
  - A State statute that provides more than an incidental effect in conflict with the express foreign policy of the federal government is arguably preempted.

Litigation Resulting from State and Regional Efforts

- Doctrine of Foreign Policy Preemption
  - In Central Valley Chrysler-Jeep case, plaintiffs argued that California's attempt to regulate GHGs from automobiles substantially interfered with and undercut the stated foreign policy of the federal administration.
  - This stated foreign policy is to forgo unilateral U.S. reductions in GHGs in favor of using the possibility of future reductions as a bargaining chip to get certain developing nations to agree to reduce their emissions.

Litigation Resulting from Carbon Capture and Storage

- Carbon capture and storage -- method to reduce carbon emissions.
- Method by which carbon dioxide separated from large point sources and transported via pipeline to an underground geological formation for long-term storage.
- Different from carbon sequestration.

Litigation Resulting from Carbon Capture and Storage

- Includes pre-combustion and post-combustion systems.
- Both technologies are well understood and already used in selected commercial applications.
- Pre-combustion – fertilizer manufacturing, hydrogen production.
- Post-combustion – natural gas processing industry.

Litigation Resulting from Carbon Capture and Storage

- Current technology captures approximately 85-95% of the carbon dioxide emissions.
- A power plant equipped with a carbon capture system would need approximately 10-40% more energy than a plant without such a system.
- Net result is a reduction in carbon dioxide emissions of approximately 80-90%.

Litigation Resulting from Carbon Capture and Storage

- Captured carbon dioxide would need to be transported to the storage areas, most likely with pipeline.
- Pipeline shipping of carbon dioxide is already carried out on a small scale.

Litigation Resulting from Carbon Capture and Storage

- Suitable geological formations include saline formations and oil and gas fields.
- Various physical and geochemical trapping mechanisms, such as the presence of caprock, should prevent the carbon dioxide from migrating to the surface.
- Estimated sufficient geological storage space for 100 years.
- Injection of captured carbon dioxide to pressurize fields and boost oil recovery could offset some of the costs of capture and storage.

Litigation Resulting from Carbon Capture and Storage

- Risks Involved in Carbon Capture and Storage
  - Release of carbon dioxide into atmosphere by pipeline rupture or leak.
  - Release of carbon dioxide by injection well failure.
  - Release of carbon dioxide by migration to the surface through faults, fractures, or abandoned wells.
  - Immediate risk to human life for exposure greater than 7 to 10% by volume in air.
  - At concentrations above 2%, carbon dioxide has a strong effect on respiratory physiology.

Litigation Resulting from Carbon Capture and Storage

- Risks Involved in Carbon Capture and Storage
  - Carbon dioxide migration in the sub-surface could result in an increase in dissolved carbon dioxide in groundwater.
  - Carbonic acid low ph could mobilize metals.
  - Injection could displace brines and contaminate shallow groundwater by increasing its salinity.
  - Injection at pressure can induce fracturing and movement along faults that could cause seismic impacts.

Litigation Resulting from Carbon Capture and Storage

- Toxic tort for personal injury or property damage
  - Common law causes of action for negligence, nuisance, trespass, and strict liability.
  - Against owners and operators of pipelines and geologic storage facilities.
- State or Federal Environmental Agencies could bring lawsuits under CERCLA, RCRA or similar statutes seeking costs to clean up groundwater contamination caused by carbon dioxide storage.

Luncheon Address – Western Climate Initiative

Steve Owens, Director of ADEQ

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February 8, 2008

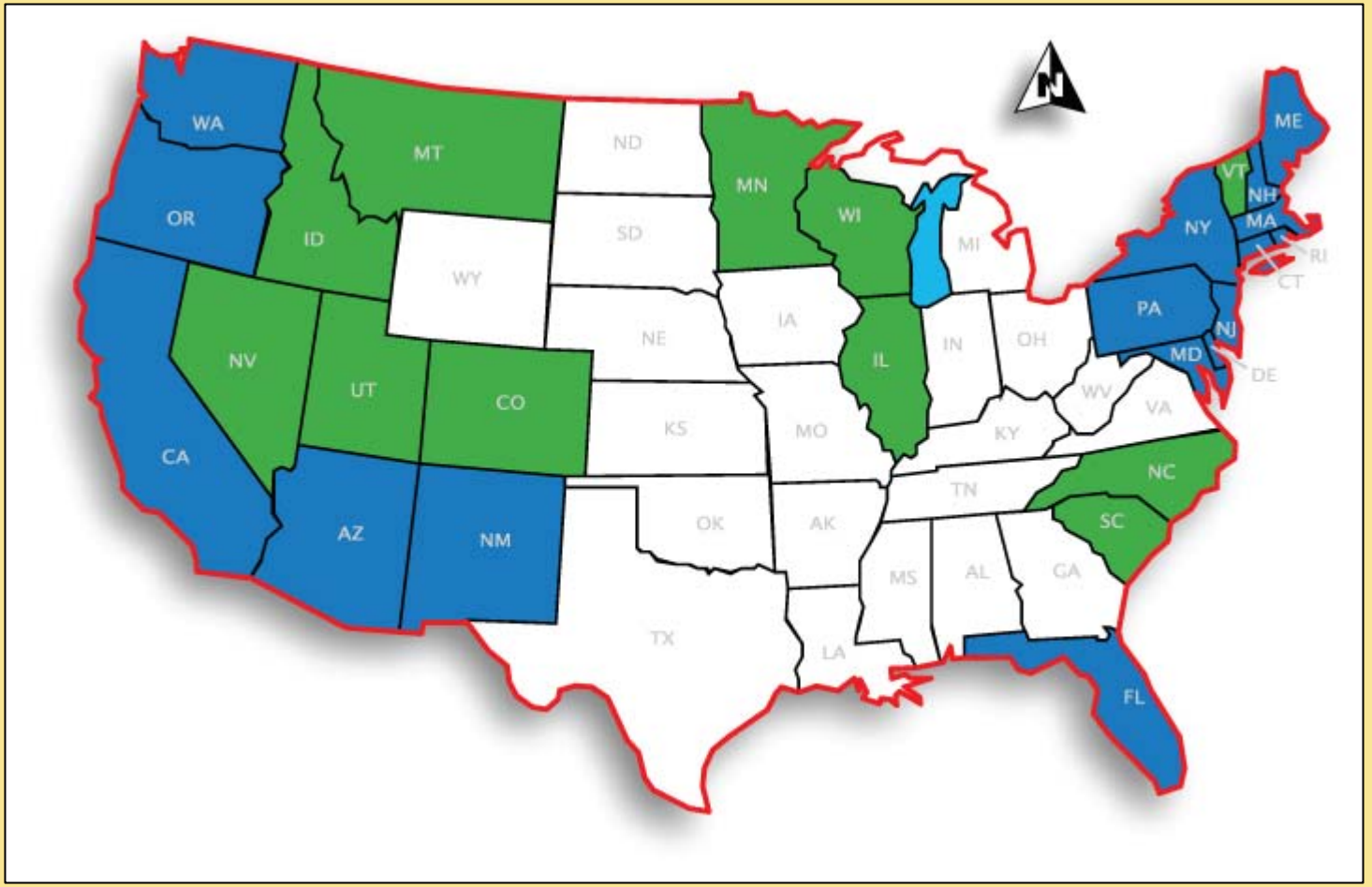
Climate Change Action in Arizona and the West

Director Steve Owens

Arizona Dep't of Environmental Quality

www.azclimatechange.gov

Current State Climate Action



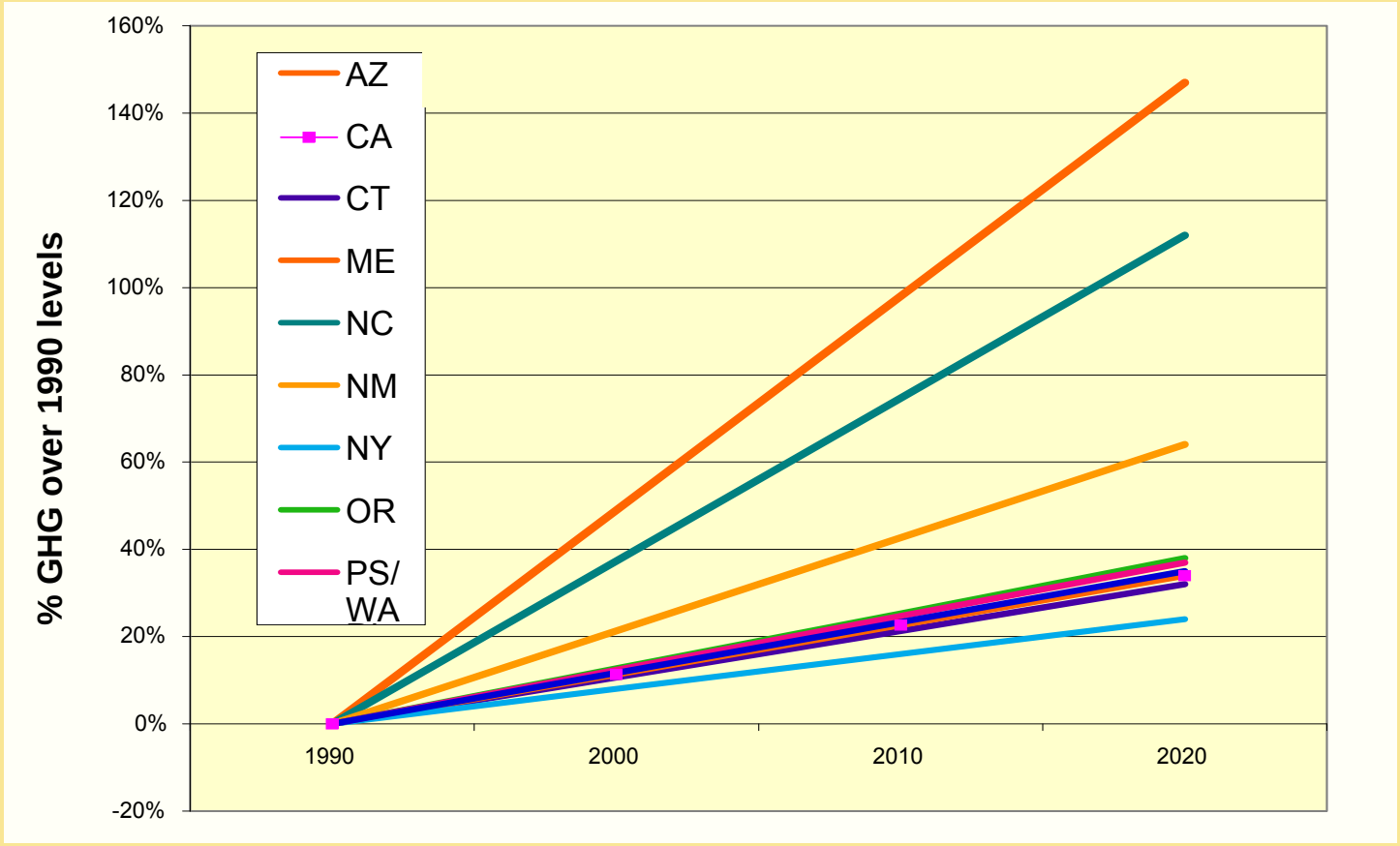
Governor Napolitano's Executive Order 2005-02

- **Created a 35-member Arizona Climate Change Advisory Group (CCAG) to:**
  - **Establish a baseline inventory and forecast of greenhouse gas emissions in Arizona**
  - **Produce an action plan to reduce Arizona's greenhouse gas emissions**

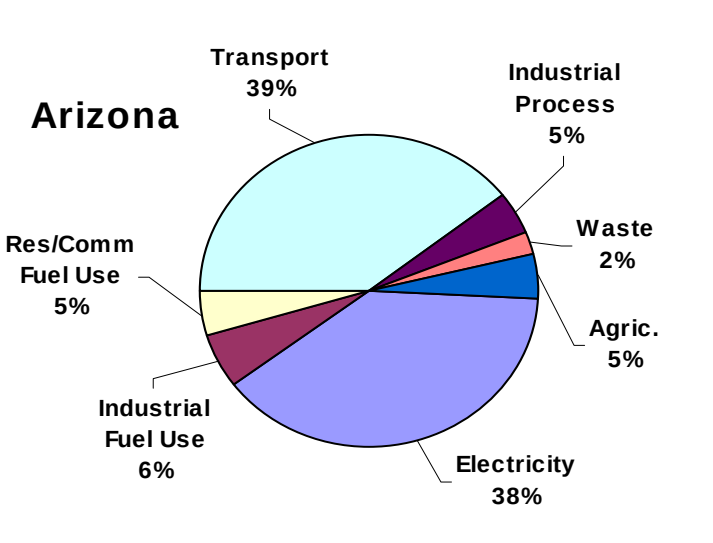
Arizona GHG Emissions Inventory & Forecast

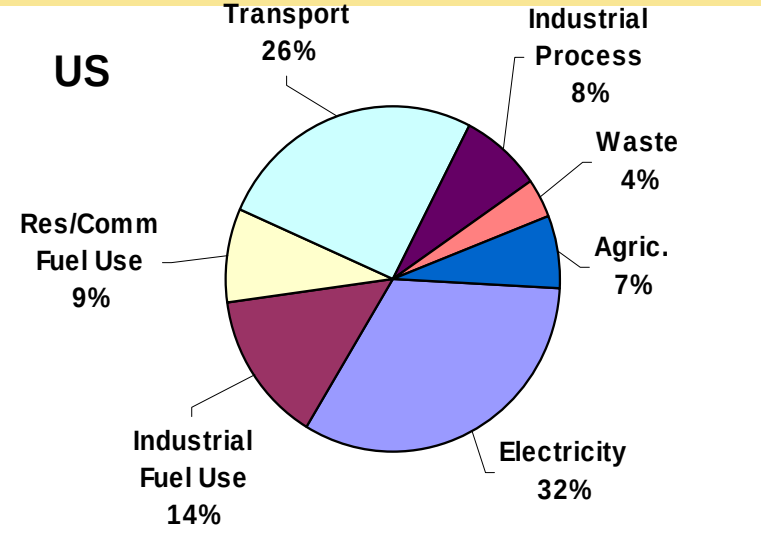
- **Arizona's GHG emissions increased by nearly 56% between 1990 and 2005 (from 59 MMT to 93 MMT)**
- **Arizona's GHG emissions are projected to increase to roughly 148% over 1990 levels by 2020 (to 147 MMT) and 200% by 2040 (to 179 MMT)**
- **Arizona has the fastest GHG emissions rate of growth in the U.S.**

State GHG Emissions Growth Rates



Arizona GHG Emissions, by sector





- **Electricity Use/Production and Transportation together account for roughly 77% of Arizona's total**

ARIZONA
CLIMATE CHANGE ADVISORY GROUP

CLIMATE CHANGE ACTION PLAN
AUGUST 2006

CCAG Recommendations

49 recommendations, focused on:

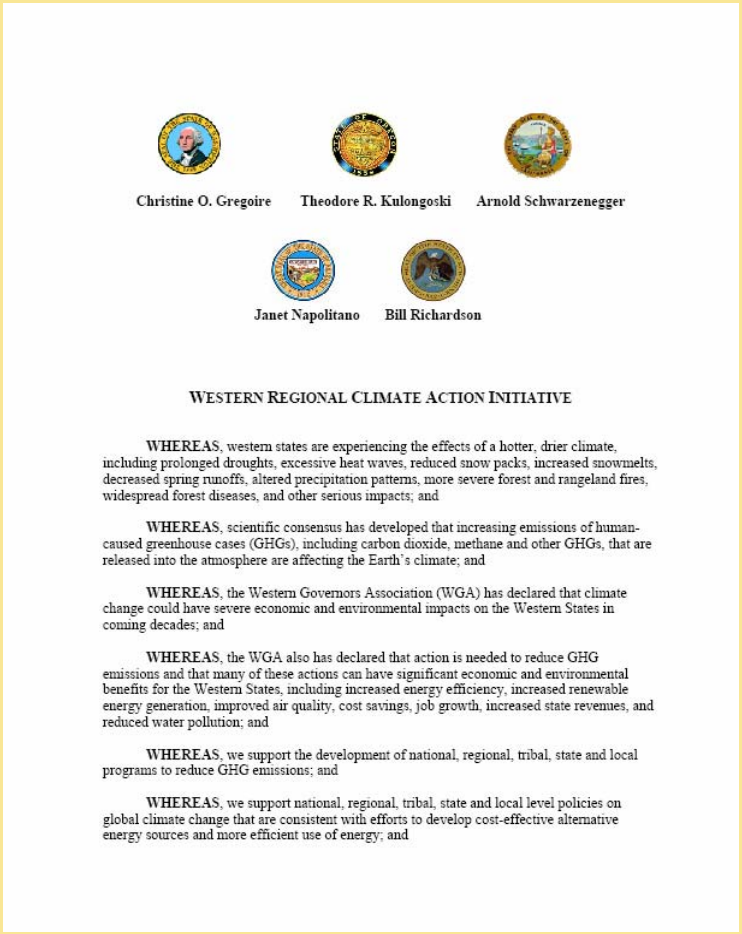
- **Reducing energy demand and increasing energy efficiency**
- **Increasing production and use of renewable energy**
- **Increasing alternative fuels and technologies for vehicles**
- **Reducing fuel use**
- **Expanding carbon sinks**
- **Reducing vehicle emissions**
- **Reporting GHG emissions and giving credit for reductions**
- **Capping and trading GHG emissions**
- **Setting a state goal: reduce Arizona's GHG emissions to 2000 level by 2020 and to 50% below 2000 level by 2040**

Governor Napolitano's Executive Order 2006-13

- **Contained specific directives, including:**
  - **Develop a GHG emissions reporting mechanism and establish a multi-state registry**
  - **Adopt the Clean Car Program**
  - **Convert state vehicle fleet to low-GHG-emissions vehicles**
- **Set goal to reduce state's GHG emissions to 2000 levels by 2020 and to 50% below 2000 levels by 2040**
- **Established Climate Change Executive Committee**

Western Regional Climate Action Initiative

- **Signed on February 26, 2007 by Washington, Oregon, California, Arizona and New Mexico**
- **Allows other U.S. states, tribes, Canadian Provinces and Mexican states to observe and join**
- **Now called Western**



Christine O. Gregoire Theodore R. Kulongoski Arnold Schwarzenegger

Janet Napolitano Bill Richardson

WESTERN REGIONAL CLIMATE ACTION INITIATIVE

WHEREAS, western states are experiencing the effects of a hotter, drier climate, including prolonged droughts, excessive heat waves, reduced snow packs, increased snowmelts, decreased spring runoffs, altered precipitation patterns, more severe forest and rangeland fires, widespread forest diseases, and other serious impacts; and

WHEREAS, scientific consensus has developed that increasing emissions of human-caused greenhouse cases (GHGs), including carbon dioxide, methane and other GHGs, that are released into the atmosphere are affecting the Earth's climate; and

WHEREAS, the Western Governors Association (WGA) has declared that climate change could have severe economic and environmental impacts on the Western States in coming decades; and

WHEREAS, the WGA also has declared that action is needed to reduce GHG emissions and that many of these actions can have significant economic and environmental benefits for the Western States, including increased energy efficiency, increased renewable energy generation, improved air quality, cost savings, job growth, increased state revenues, and reduced water pollution; and

WHEREAS, we support the development of national, regional, tribal, state and local programs to reduce GHG emissions; and

WHEREAS, we support national, regional, tribal, state and local level policies on global climate change that are consistent with efforts to develop cost-effective alternative energy sources and more efficient use of energy; and

WCI

www.westernclimateinitiative.org

- **Commitments:**
  - **Within 6 months, set a regional goal for reducing GHG emissions**
  - **Within 18 months, develop a design for a regional market-based multi-sector mechanism, such as a load-based cap and trade program, to achieve the regional goal**
  - **Participate in a multi-state GHG registry**

WCI Participants

- **Original Members:**
  - **Arizona**
  - **California**
  - **New Mexico**
  - **Oregon**
  - **Washington**

- **New Members:**
  - **Utah**
  - **British Columbia**
  - **Manitoba**
  - **Montana**
  - **Ontario (pending)**

Original WCI States & Goals

- ***Arizona***:
  2000 by 2020; 50% below 2000 levels by 2040
- ***California***:
  2000 by 2010; 1990 by 2020; 80% below 1990 by 2050
- ***New Mexico***:
  2000 by 2012; 10% below by 2020; 75% below by 2050
- ***Oregon***:
  1990 by 2010; 10% below by 2020; 75% below by 2100
- ***Washington***:
  1990 by 2020; 25% below 1990 by 2035; 50% below 1990 by 2050

New WCI Participants

- ***Utah***:

  Will adopt state goal by May 2008

- ***British Columbia***:

  10% below 1990 levels by 2020

- ***Manitoba***:

  1990 levels by 2012; 6% below 1990 by 2020

- ***Montana***:

  1990 levels by 2020

- ***Ontario***:

  6% below 1990 by 2014; 15% below 1990 by 2020; 80% below 1990 by 2050

- ***Observers***:

  Alaska, Colorado, Idaho, Kansas, Nevada, Wyoming,

  Quebec, Saskatchewan, Sonora, Tamaulipas, Baja California, Chihuahua

WCI Regional Goal

- **Aggregate reduction of 15% below 2005 levels by 2020**
- **Regional goal reflects the combined impact of individual goals of the WCI partners**
- **Goal statement and metrics located at www.westernclimateinitiative.org/ewebeditpro/items/O104F13006.pdf**
- **WCI partners also have committed to do their share to reduce worldwide CO2 emissions between 50% and 85% by 2050**

WCI Subcommittees

- **Allocations**
  - **Steve Owens, AZ (Owens.Stephen@azdeq.gov)**
- **Reporting**
  - **Jim Norton, NM (jim.norton@state.nm.us)**
- **Electricity**
  - **Dave Van'thof, OR (david.vanthof@state.or.us)**
- **Offsets**
  - **Tim Lesiuk, BC (Tim.Lesiuk@gov.bc.ca)**
- **Scope**
  - **Michael Gibbs, CA (mgibbs@calepa.ca.gov)**

WCI Option Papers

- **Written comments due Feb. 1**
- **Options papers available at www.westernclimateinitiative.org**
- **Stakeholder Calls**
  - **To be held 8:30 am PST / 9:30 am MST**
  - **Call-in numbers for all calls: 1-800 868-1837 (toll free)**
  - **Pubic Participant Code: 659 537#**
- **Schedule of Calls**
  - **Electricity: Feb. 11**
  - **Scope: Feb. 12**
  - **Allocations: Feb. 13**
  - **Offsets: Feb. 14**
  - **Reporting: Feb. 15**

Comments on Subcommittee Recommendations

- **Scope and Electricity:**
  - **Subcommittee drafts released for review and comment during week of March 3**
  - **Stakeholder call to discuss drafts during week of Mar 10**
  - **Written comments due March 17**

- **Allocations and Reporting:**
  - **Subcommittee drafts released for review and comment during week of March 31**
  - **Stakeholder call to discuss drafts during week of April 7**
  - **Written comments due April 16**

- **Offsets:**
  - **Public Workshop on Options – Vancouver, March 26**
  - **Discussion drafts will be available prior to workshop**

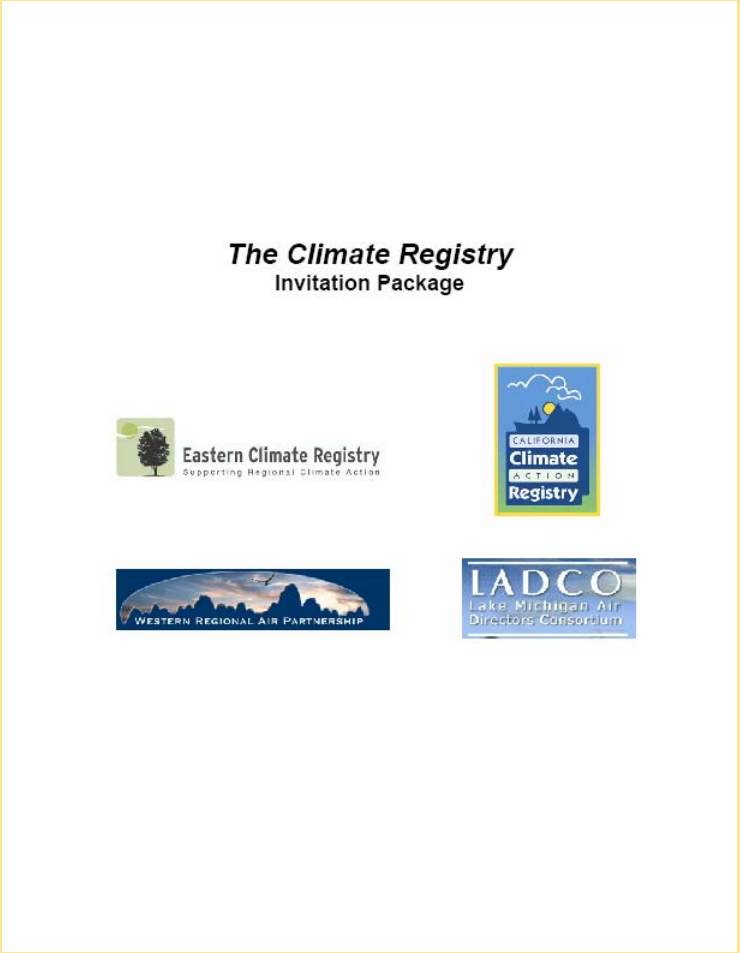
WCI Work Schedule

- **February 20-21 (Salt Lake City, UT)**
- **March 19-20 (Sacramento, CA)**
- **April 23-24 (Seattle, WA)**
- **Week of May 5: Draft Recommendations Released**
- **May 21-22 (Salt Lake City, UT)**
  - **Stakeholder Meeting – May 21**
  - **WCI Meeting – May 22**
- **June 17-18 (Montana)**
- **Mid-July: Draft final recommendations released**
- **July 29-30 (California)**
- **Late August**
  - **WCI Meeting (Santa Fe, NM)**
  - **Announcement of Program Design and Next Steps**

The Climate Registry

www.theclimateregistry.org

- Multi-state/national GHG emissions registry
- Created by WRAP, CCAR, ECR (NESCAUM states) and Midwestern (LADCO) states
- Purpose:
  - Provide a common GHG currency and minimize the reporting burden
  - Provide baseline protection
  - Includes tribes
  - Canadian provinces and Mexican states can join



The Climate Registry

- **States**

  AL, AZ, CA, CO, CT, DE, FLA, GA, HI, IA, ID, ILL, KS, ME, MD, MA, MI, MN, MO, MT, NH, NV, NJ, NM, NY, NC, OH, OK, OR, PA, RI, SC, TN, UT, VA, VT, WA, WI, WY

- **Tribes**

  Campo Kumeyaay Nation, Pueblo of Acoma, Southern Ute Tribe

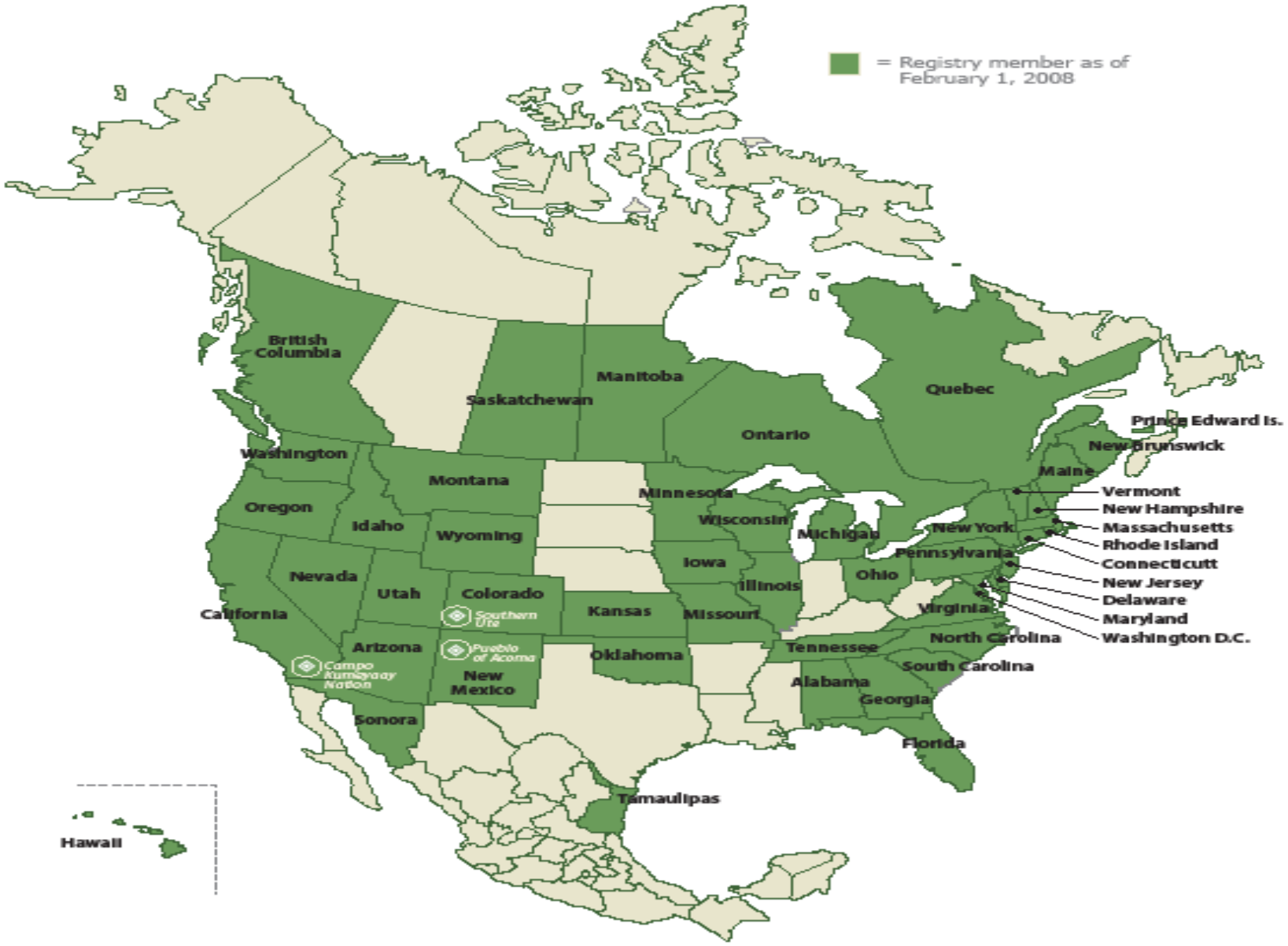
- **Provinces**

  British Columbia, Manitoba, Quebec, Saskatchewan

- **Mexican States**

  Sonora, Tamaulipas

  (Baja California & Chihuahua intend to join)


= Registry member as of February 1, 2008
British Columbia
Manitoba
Saskatchewan
Quebec
Ontario
Prince Edward Is.
New Brunswick
Maine
Vermont
New Hampshire
Massachusetts
Rhode Island
Connecticutt
New Jersey
Delaware
Maryland
Washington D.C.
Washington
Montana
Minnesota
Oregon
Idaho
Wyoming
Wisconsin
Michigan
New York
Pennsylvania
Iowa
Ohio
Nevada
Utah
Colorado
Illinois
California
Kansas
Missouri
Virginia
North Carolina
Arizona
Oklahoma
Tennessee
South Carolina
New Mexico
Alabama
Georgia
Sonora
Florida
Tamaulipas
Hawaii
Southern Ute
Pueblo of Acoma
Campo Kumeyaay Nation

Draft General Reporting Protocol

- **Available on TCR website:**
  www.theclimateregistry.org/
- **Submit written comments by March 14**
- **Use template on TCR website**
- **Technical workshops on protocol**
  - **Feb. 7: San Francisco**
  - **Feb. 15: Washington, DC**
  - **Feb. 20: Chicago**

Midwestern Regional Greenhouse Gas Reduction Accord

www.midwesterngovernors.org/resolutions/GHGAccord.pdf

- **Signed November 16, 2007**
- **Parties:**
  - **Signatories: Illinois, Iowa, Kansas, Michigan, Minnesota, Wisconsin, Kansas, Manitoba**
  - **Observers: Indiana, Ohio, South Dakota**
- **Purpose:**
  - **Establish GHG reduction targets and timeframes**
  - **Develop a market-based, multi-sector cap-and-trade mechanism**
  - **Establish a GHG tracking, management and crediting system**
  - **Implement other steps, such as a low-carbon fuel standard**

Update on Toxic Tort and Insurance Litigation Developments Related to Climate Change

Fred Bellamy, Partner

When Experience Matters®

STEPTOE&JOHNSON LLP

www.steptoe.com

February 8, 2008

A Policy Debate – Implicit Assumption

		Action	
Manmade Greenhouse Gases Hypothesis	Correct	Moderate	None
		+ Mitigate harms +/-Mild negative, neutral or positive economic impact + Expand environmental conservation + Enhance security & diplomacy	- Aggravate harms - Potential disruption of our way of life as we know it
	Wrong	0 No significant impact +/- Mild negative neutral or positive economic impact + Expand environmental conservation + Enhance security & diplomacy	0 No impact

Debate Tips From Academic Questions to Action Agenda

- What to do
  - Who decides
  - How decided
- Who's to blame
  - Who decides
  - How decided

How Will Tort Litigation Fit into the Picture?

- Historical examples:
  - Asbestos
  - Tobacco

Global Warming Is Different

- Global
- Immeasurably Complex
- Unprecedented Scope

Everyone v. Everyone Else

Who Will Decide What to Do and How?

- Tort System:
  - Juries
  - Judges
    - Testifying experts
    - Causation

Courts are ill-equipped to make risk-based policy decisions.

Primary Type of Potentially Available Tort Claims

- Public nuisance
- Private nuisance
- Negligence

Inherent Limitations in Tort Litigation

- Political Issue
- Causation
- Joinder of Parties/Completeness of Relief
- Standing
- Class Action Status

Non-Justifiable Political Question

1) Textually demonstrable commitment to another branch of government
2) Lack of judicially discoverable and manageable standards
3) Impossibility of deciding case without an initial policy determination of kind calling for non-judicial discretion
4) Impossibility of judicial resolution without expressing due respect for other branches
5) Unusual need for unquestioning adherence to a political decision already made
6) Potential embarrassment from conflicting pronouncements

Causation

- Cause in Fact
  - General
  - Specific
- Proximate (Legal) Cause

Joinder of Necessary Parties and Completeness of Relief

1) Prejudice to existing and absent parties
2) Extent to which prejudice may be mitigated
3) Adequacy of judgment or relief
4) Whether plaintiff would otherwise have an adequate remedy at law

Standing

1) Injury in fact
   - Concrete and particularized
   - Actual, imminent – not conjectural or hypothetical
2) Causal connection between injury and alleged conduct
3) Likelihood that injury will be redressed by a favorable decision

Class Action Status

1) Numerosity
2) Commonality
3) Typicality
4) Appropriate representatives

Connor v. Murphy Oil (S.D. Miss. Aug. 30, 2007)

- Class action against insurance, oil, coal and chemical companies
- Property damages from Hurricane Katrina
- Dismissal on political question and standing grounds

Connecticut v. American Electric Power Co., 406 F. Supp. 2d 265 (S.D. N.Y. 2005)

- Several states sued 5 power companies
- Alleged 650 million tons of GHG per year constitute a public nuisance
- Sought judicial imposition of emission reduction requirements
- Dismissed – “transcendently legislative nature”

California v. GMC (N.D. Cal. Sept. 17, 2007)

- California sued 6 major auto makers
- Suit sought massive damages and injunctive relief
- Dismissed, citing *AEP*
  - Requires initial policy decision
  - Implicates interstate commerce
  - Would impose damages for lawful worldwide sale
  - Implicates foreign policy

Conclusion: What Could Change?

- Development of legislative and regulatory standards
- Lack of clarity regarding preemption implications
- Calm before the coming storm?

Thank You!

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