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SLIDES: Climate Change Action in Arizona & the West

Stephen A. Owens

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Climate Change Action in Arizona & the West

Natural Resources Law Center
University of Colorado School of Law
June 9, 2006

Presentation by Director Stephen A. Owens
Arizona Department of Environmental Quality

Executive Order 2005-02

- **Signed by Governor Napolitano on February 2, 2005**
- **“Arizona and Western States have particular concerns about the impacts of climate change and climate variability on our environment, including the potential for prolonged drought, severe forest fires, warmer temperatures, increased snowmelt, reduced snow pack and other effects.”**
- **“Actions to reduce greenhouse gas emissions, including energy efficiency, conserving natural resources and developing renewable energy sources, may have multiple benefits, including economic development, job creation, cost savings, and improved air quality.”**

Arizona Climate Change Advisory Group

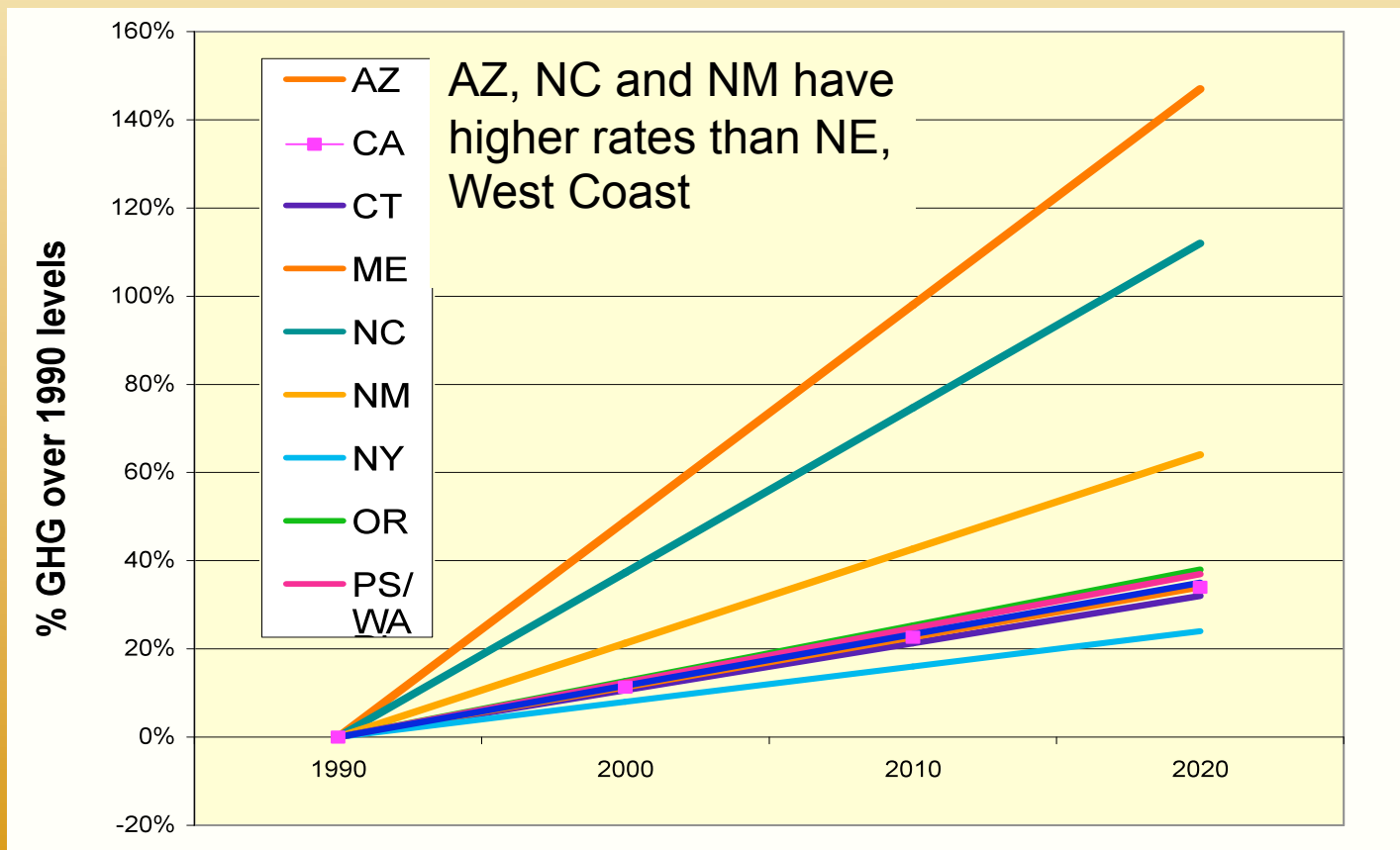
www.azclimatechange.us

- Executive Order 2005-02 created the Arizona Climate Change Advisory Group (CCAG)
- CCAG Charge:
 - Establish a baseline inventory and forecast of greenhouse gas emissions in Arizona by June 30, 2005
 - Produce an action plan with recommendations for reducing greenhouse gas emissions by June 30, 2006

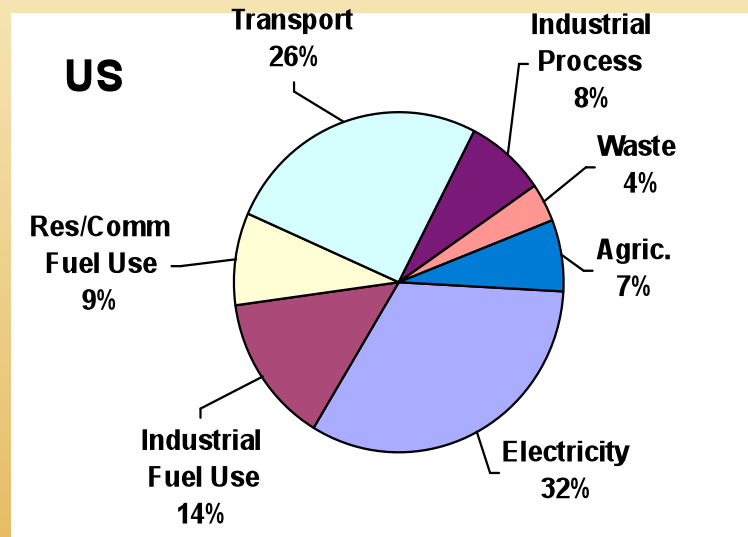
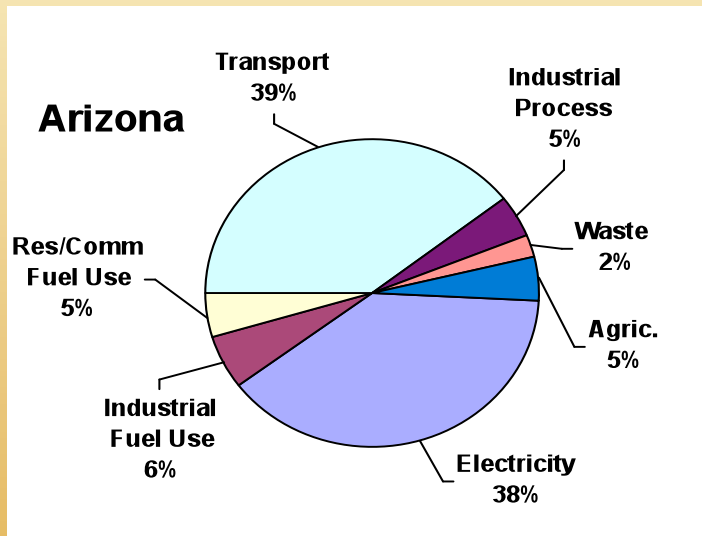
Arizona GHG Emissions & Inventory

- **Arizona presently accounts for approximately 92.6 million metric tons (MMT) annually of GHG emissions – roughly 1% of the nation's total**
- **Arizona's GHG emissions have increased more than the nation as a whole, due to rapid population growth, although per capita emissions are lower than national average**
- **Arizona's GHG emissions increased by nearly 40% between 1990 and 2000 (from 59 MMT to 82 MMT)**
- **Arizona's GHG emissions are projected to increase to roughly 150% over 1990 levels by 2020 (to 147 MMT) and over 200% by 2040 (to 179 MMT)**

State GHG Growth Forecasts



Arizona GHG Emissions, by sector



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

Arizona CCAG Process

- **The CCAG established five sector-based Technical Work Groups (TWGs) to develop GHG reduction options:**
 - **Energy Supply**
 - **Residential-Commercial-Industrial Use**
 - **Transportation and Land Use**
 - **Agriculture and Forestry**
 - **Cross-Cutting Issues**

Key Preliminary CCAG Recommendations

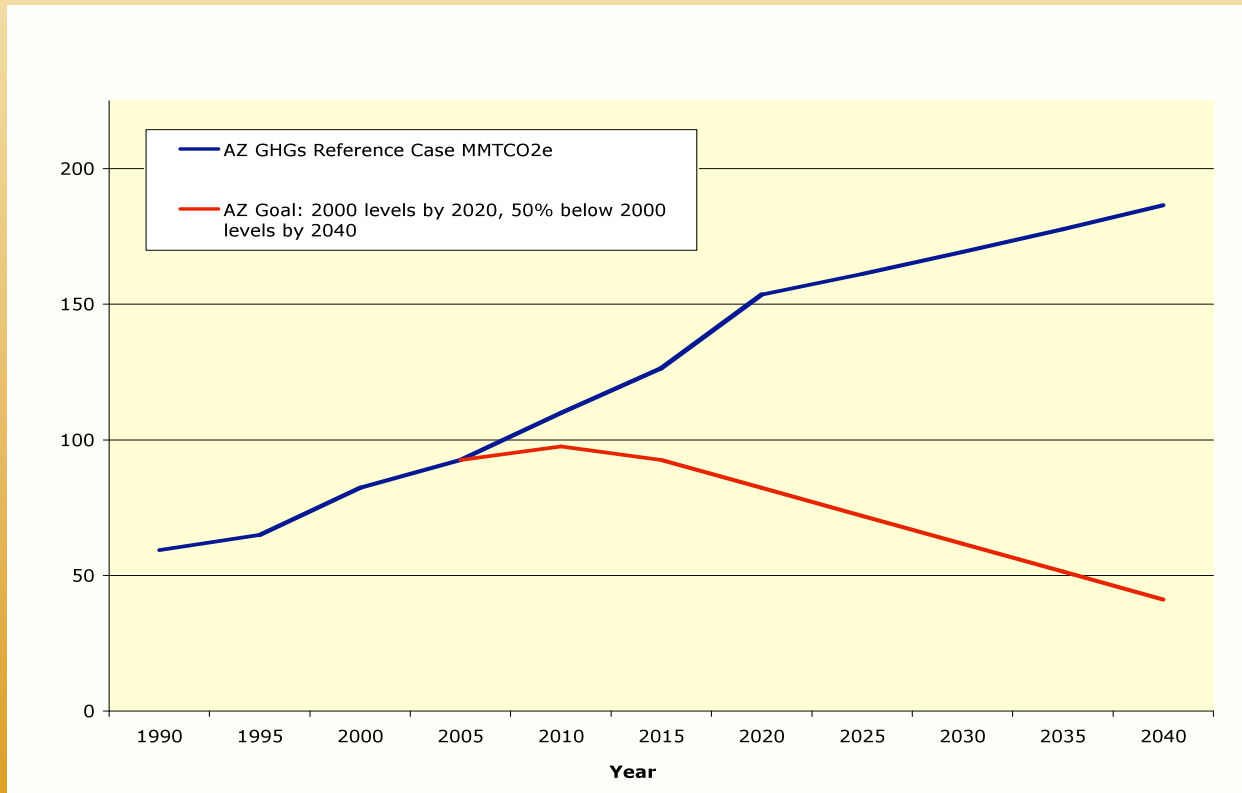
Approximately 50 preliminary recommendations, including:

- **Increased Environmental Portfolio Standard & Incentives for Renewable Energy**
- **Metering & Pricing Strategies and Integrated Resource Planning**
- **Demand-Side Efficiency Goals, Funds, Incentives and Programs**
- **Enhanced Appliance Standards, Building Standards/Codes and Building Design Incentives and Programs**
- **Distributed Generation/Renewable Energy Applications**
- **Smart Growth Bundle of Options**
- **Multimodal Transit Bundle of Options**
- **Idle Reduction Technologies & Anti-Idling Enforcement**
- **Increased Use/Production of Alternative Fuels and Technologies for Vehicles**

Key Preliminary CCAG Recommendations (cont.)

- **Cap & Trade Program on National or Regional Basis**
- **Mandatory Reporting of GHG Emissions**
- **GHG Emissions Registry**
- **California GHG Vehicle Emission Standards**
- **Goals & Timelines:**
 - **Reduce Arizona's GHG Emissions to 2000 Levels by 2020**
 - **Reduce Emissions to 50% Below 2000 Levels by 2040**

Reduce GHG Emissions to 2000 Levels by 2020, 50% Below 2000 Levels by 2040



State Climate Goals

State	GHG Emissions Reduction Goals and Timelines
AZ	2000 levels by 2020; 50% below 2000 levels by 2040
CA	2000 by 2010; 10% below by 2020; 75% by 2050
CT	1990 by 2010; 10% below by 2020; 75% by 2100
MA	1990 by 2010; 10% below by 2020; 75% by 2100
ME	1990 by 2010; 10% below by 2020; 75% by 2100
NC	TBD
NJ	5% -1990 by 2005
NM	2000 by 2012; 10% below by 2020; 75% by 2050
NY	5% below 1990 by 2010
OR	1990 by 2010; 10% below by 2020; 75% by 2100
PS/WA	1990 by 2010; 10% below by 2020; 75% by 2100
RI	1990 by 2010; 10% below by 2020; 75% by 2100

AZ Environmental Portfolio Standard

- **Adopted by AZ Corporation Commission in March 2006**
- **Increases existing 1.15% renewable energy requirement (RER) to 15% by 2025 (based on kWh sold)**
- **Eligible Resources (no nuclear or fossil fuel)**
 - **Biogas and biomass electricity generators, certain hydropower facilities, fuel cells that use renewable fuels, geothermal generators, hybrid wind and solar electric generators, landfill gas generators, solar electricity resources, wind generators and certain “distributed renewable energy resources”**
- **Also has Distributed RER (DRER) requirement**
 - **Increases from 5% of the RER in 2007 to 30% by 2012**
 - **½ of the DRER must come from residential applications and ½ from non-residential, non-utility applications**

Southwest Climate Change Initiative

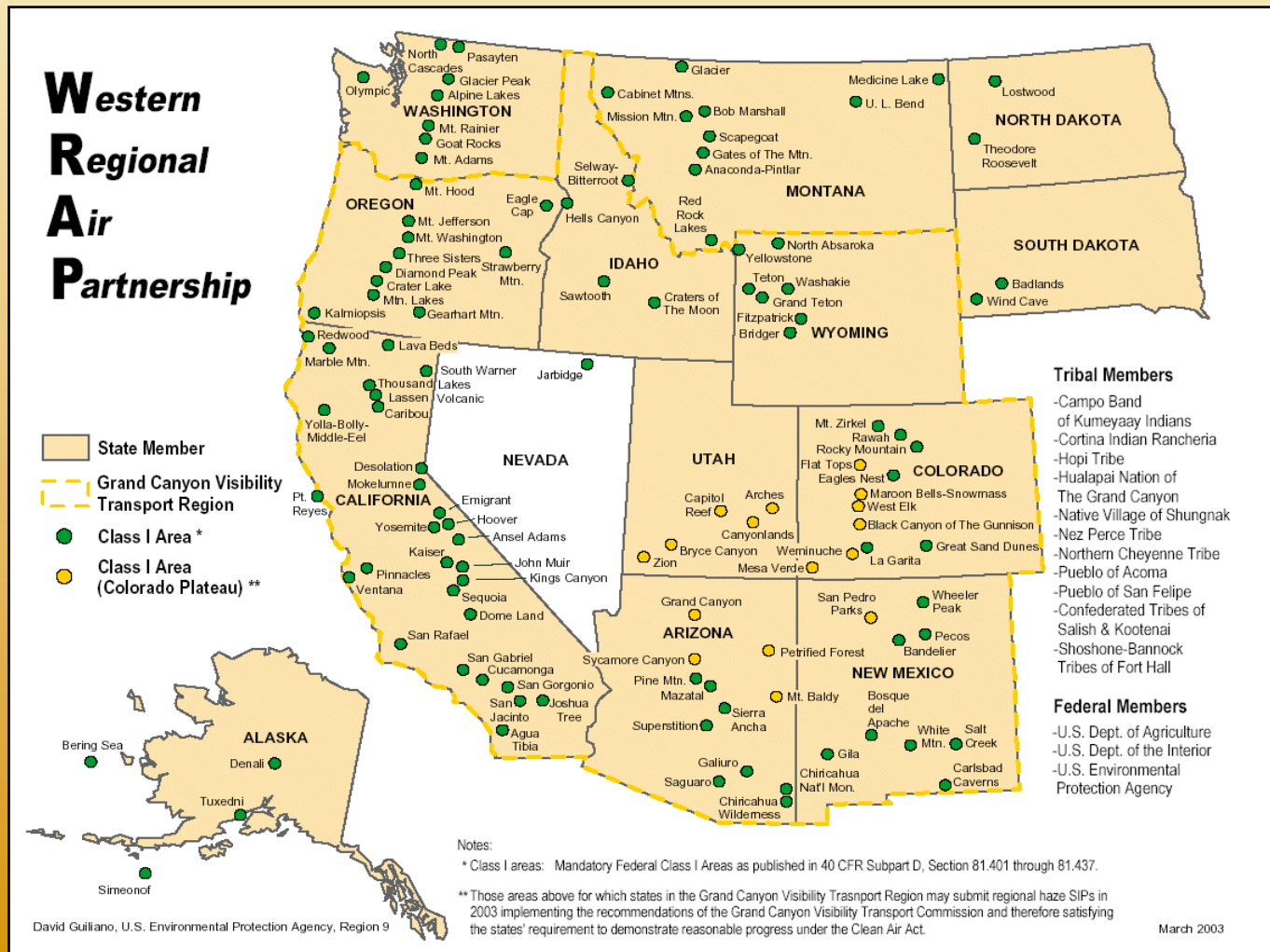
- **Signed by Arizona Governor Janet Napolitano and New Mexico Governor Bill Richardson on February 28, 2006.**
 - **The states “agree to collaborate in identifying, evaluating and implementing ways to reduce greenhouse gas emissions and achieve related co-benefits.”**
- **Governors Initiative to be administered by ADEQ and the New Mexico Environment Department**

AZ-NM Collaboration May Include:

- **Development of consistent approaches for measuring, forecasting and reporting emissions of greenhouse gases;**
- **Development of consistent approaches to recognize and give credit for public and private actions to reduce greenhouse gas emissions;**
- **Identification and evaluation of policy options for reducing greenhouse gas emissions within individual states and jointly across state, regional and international borders;**
- **Establishment of cooperative policies, programs, pilots and/or demonstration projects for greenhouse gas reductions;**
- **Cooperation with Native American Tribes and communities;**
- **Identification and promotion of climate change mitigation actions, energy efficient technologies and clean and renewable energy sources;**
- **Identification of and advocacy for regional and national climate policies that reflect the needs and interests of Southwestern states;**
- **Improvement of institutional capacity to address climate mitigation needs.**

Western Regional Air Partnership

www.wrapair.org



WRAP Work on Climate Change

WRAP Purpose: “Identify regional or common air management issues, develop and implement strategies to address these issues, and formulate and advance western regional policy positions on air quality.”

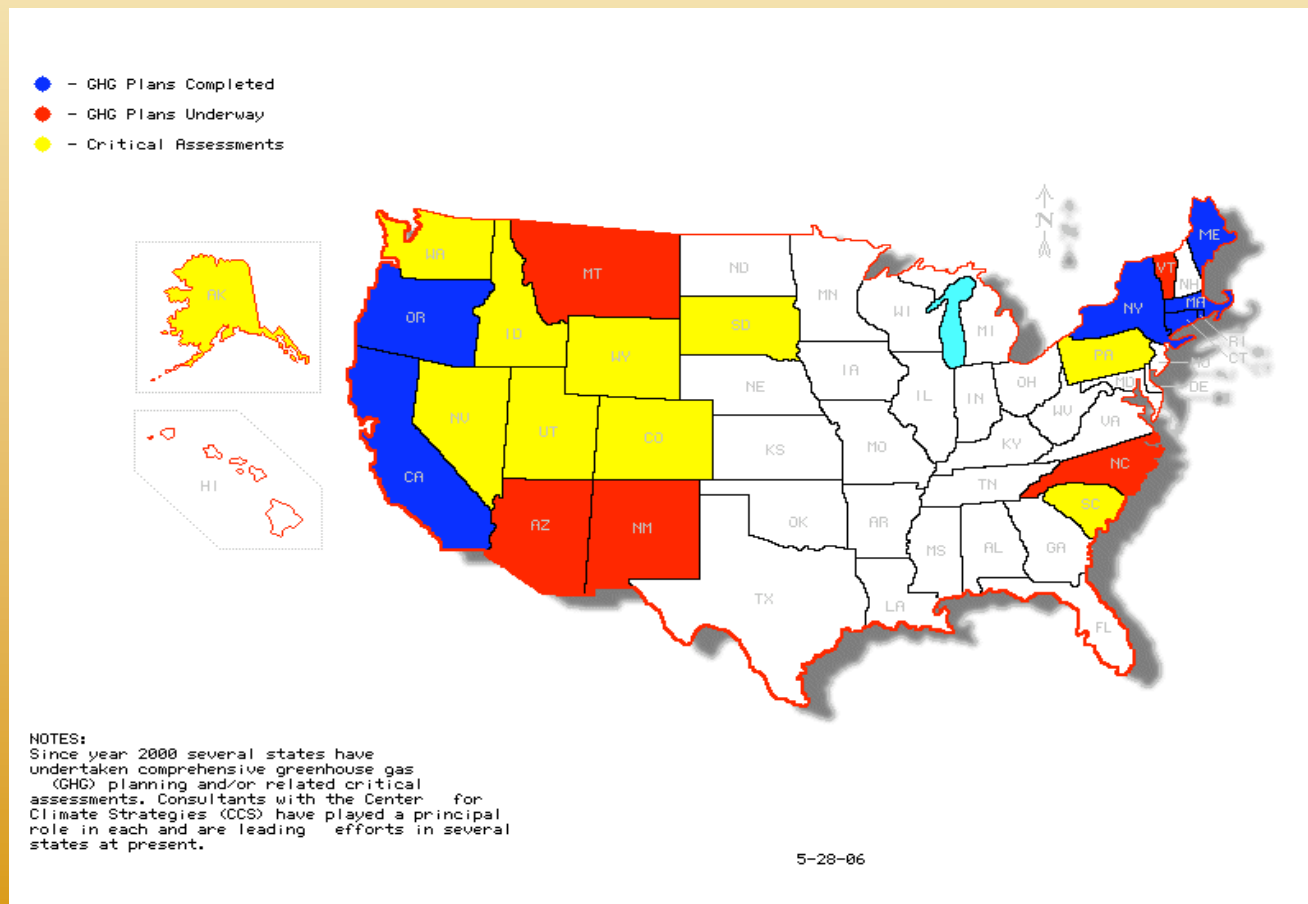
WRAP Goal: “Initiate and coordinate activities associated with the management of regional or common air quality issues in the western region of the United States.”

- **WRAP Consideration of Climate Change Issues to Date:**
 - **November 2004 Board Meeting in Salt Lake City**
 - **May 2005 Board Meeting with Climate Change Presentation in Tempe**
 - **August 2005 Ad Hoc Climate Change Work Group Meeting in Santa Fe**
 - **December 2005 Board Meeting in Palm Springs**
 - **April 2006 Climate Change Workshop in Salt Lake City**

WRAP Next Steps

- **Decisions made at April 2006 Climate Change Workshop in Salt Lake City**
 - **Assist interested WRAP States and Tribes to develop GHG emissions inventories and forecasts during next 12-18 months**
 - **Work to be performed by Center for Climate Strategies**
 - **Compilation of WRAP-region inventory and forecast in 2007**
 - **Workgroup formed to consider Western Regional Registry**
- **July 2006 Registry Workshop in Denver**
- **September 2006 WRAP Board Meeting in Whitefish, MT**

State Climate Change Policy Actions



WRAP States Climate Goals

- **AZ 2000 by 2020; 50% below 2000 levels by 2040**
- **CA 2000 by 2010; 10% below by 2020; 75% below by 2050**
- **NM 2000 by 2012; 10% below by 2020; 75% below by 2050**
- **OR 1990 by 2010; 10% below by 2020; 75% below by 2100**
- **WA 1990 by 2010; 10% below by 2020; 75% below by 2100**

WGA Clean & Diversified Energy Advisory Committee (CDEAC)

www.westgov.org

- **June 2004 WGA Resolution**
 - **Develop 30,000 MW of clean energy in the West by 2015**
 - **Solar, wind, geothermal, biomass, advanced coal technologies and advanced natural gas technologies**
 - **Increase energy efficiency by 20% by 2020**
- **First meeting in February 2005 in San Francisco**
- **Report to be presented at June 2006 WGA meeting in Sedona, AZ**

CDEAC (cont.)

Task Force Estimates for 30,000 MW:

- **Solar:** As much as 8,000 megawatts (MW) through a combination of distributed solar electricity systems and central concentrating solar power (CSP) plants, with another 2,000 MW (thermal) of solar hot water realistically available
- **Geothermal:** 13,000 MW of geothermal energy within a reasonable time frame, with 5,600 MW commercially viable
- **Biomass:** Potentially 10,000 MW
- **Wind:** Between 5,000 MW and 9,175 MW either in development or can be reasonably assumed with minimal transmission additions, with dramatic increases as transmission becomes available

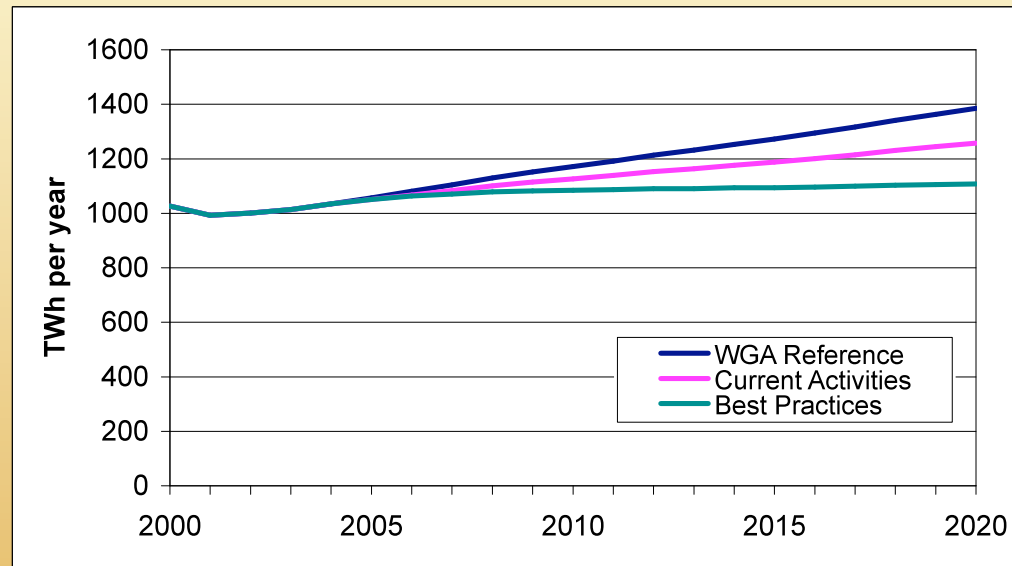
White Papers:

- **Combined Heat and Power:** 42,800 MW of additional CHP potential
- **Hydro Power:** Potentially 3,000 MW more at sites already on the grid

CDEAC Advanced Coal Task Force

- **Incentives should be directed to certain advanced coal technologies in two “Tiers” for 5,000 MW**
- **Tier I:
Place highest priority on incentives to facilitate the development of four to five electricity generating plants (approximately 2,000 MW total) that use coal for fuel and that capture and sequester at least 60% of their CO2 emissions**
- **Tier II:
Also provide incentives to projects (approximately 3,000 MW total) employing technologies not yet commercially deployed in the West that move toward zero CO2 emissions and carbon capture and sequestration (including, but not limited to, gasification, ultra supercritical coal and oxy-combustion)**

CDEAC Energy Efficiency Estimates



- **Projected electricity load growth/year in WGA States ranges between 1.9% (Reference scenario) and 1.3% (Current Activities scenario)**
- **Best Practices Scenario could cut growth to 0.5% annually and reduce the need for construction of new generating facilities by as much as 75% over the next 15 years**
- **Potential 17% reduction in CO₂ emissions by 2020**

CDEAC Report

“A Western energy system that meets the WGA clean and diversified energy objectives will significantly mitigate some of the region’s most serious environmental and public health problems and result in overall environmental benefits to the West, including reduction in land impacts, consumption and pollution of scarce water resources, and air emissions such as sulfur oxides, nitrogen oxides, particulate matter, and mercury. In addition the recommendations in this report, including those from the ACTF, will drive toward reductions in emissions of carbon dioxide and potentially toward recovery and sequestration of carbon for beneficial uses.”