U.S. EPA Region 8 Climate Change Strategic Plan

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U.S. EPA REGION 8 CLIMATE CHANGE STRATEGIC PLAN

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I. INTRODUCTION

In June, 2007, EPA Region 8 designated "climate change" as a regional priority. Shortly thereafter, an internal Climate Change Workgroup was established with representatives from various Region 8 program areas. The workgroup compiled a matrix of current activities with a climate change nexus, and a Climate Change Coordinator was hired in November, 2007. Working together, they developed this Climate Change Strategic Plan (referred to as "the Plan" throughout this document), which is consistent with the Agency's national Strategic Plan goals and objectives.[1] Further, climate change measures were added to the Regional Administrator's commitments for 2008.

The objectives of the Plan are to:

- Assess and plan for the effects of climate change on current and future responsibilities of the regional office.
- Identify and implement goals and priority activities that have the highest potential to reduce greenhouse gas emissions.
- Identify and implement goals and priority activities that have the highest potential to increase our capacity to adapt to climate variability.
- Support our partners in their response to the challenge of climate change through knowledge building, technical assistance, and partnerships.
- Demonstrate the specific accomplishments of the Plan.

The Climate Change Workgroup and their associated programs have been evaluating ways in which we can make progress toward these objectives. A set of overarching goals were identified under which current activities were listed, as well as a set of future high potential activities that will be implemented as resources or opportunities present themselves. Our success will be measured and reported in a variety of ways, based on our current capabilities. The Plan is an evolving document that will be updated annually to reflect further evaluations and our growing capacity to prioritize and measure the results of our activities.

While the Plan is a stand-alone document, it will complement and at times overlap with the goals and strategic plans of other regional priorities, including Energy, Agriculture, Revitalization, and Supporting State Capacity, as well as other national and regional policies and plans. These other policies and plans include ENERGY STAR®, the

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Resource Conservation Challenge Programs, Sustainable Infrastructure, Executive Order 13423, and Natural Gas STAR, among others. The main areas of intersection include activities related to energy efficiency, renewable energy, waste reduction, materials management, clean energy, green building, carbon sequestration, biofuels, sustainable agriculture, environmental management systems, and our state and tribal partnerships and technical assistance efforts. The Plan is distinct in its focus on the reduction of greenhouse gases and the enhancement of our ability to adapt to the negative effects of climate change.

The term “climate change” used in the Plan refers to both global warming and other effects on the climate system caused by the buildup of greenhouse gases in the atmosphere resulting from natural and anthropogenic sources.

II. EXECUTIVE SUMMARY

Introduction:

In 2007, EPA Region 8 designated "climate change" as a regional priority, established an internal Climate Change Workgroup, and hired a Climate Change Coordinator. Working together, they developed this Climate Change Strategic Plan (referred to as "the Plan" throughout this document), which is consistent with the Agency's national Strategic Plan goals and objectives. Climate change measures were also added to the Regional Administrator's commitments for 2008.

While the Plan is a stand-alone document, it will complement and at times overlap with the goals and strategic plans of other regional priorities, including Energy, Agriculture, and Revitalization, as well as other national and regional policies and plans.

Background:

EPA Region 8 is made up of a diverse set of landscapes, population bases, and economic sectors making our response to climate change particularly difficult in its complexity. Our lands are governed by six states, 27 tribal nations, and a host of federal agencies, with 50% of our landmass publicly-owned. These entities have diverse and often competing interests that include agriculture, energy development and production, environmental protection and stewardship, industry, recreation, tourism, and urbanization. Our roughly 10 million people are concentrated in two main urban corridors as well as a few isolated cities and towns – often separated by large distances.

According to the Intergovernmental Panel on Climate Change (IPCC), an international collaborative of scientists and government representatives, climate changes in response to increasing greenhouse gases have already had a measureable effect in the region. These changes are expected to continue to threaten our water resources, agricultural production, forests, wildlife habitats, alpine ecosystems, and human health throughout the 21st century.

Five EPA Region 8 States completed comprehensive greenhouse gas emissions inventories in 2007. The inventories are based on the region's consumption of electricity, and do not include electricity that is produced for export outside the region. Based on these, and a cursory evaluation of the emissions from the State of North Dakota, the following greenhouse gas emissions profile emerged:

- The States in EPA Region 8 were responsible for approximately 5.3% of the nation's greenhouse gas emissions in 2005 totaling 362.39 MMtCO2e.
- The principal sources of the region's emissions vary by state, but include energy use, transportation, the fossil fuel industry, and agriculture.

- The rate of increase in greenhouse gas emissions from 1990 to 2005 in five of the six Region 8 States was high compared to the national average due primarily to the demand for energy by a growing population, and growth of the fossil fuel industry.
- In 2005, the average per capita emissions among the Region 8 States was high compared to the national average due to a strong fossil fuel production industry, agricultural intensity, large distances between services, and a low population base.
- The region has a large carbon sink in its forest biomass, rangelands, and agricultural soils that is threatened by reduced forest health, forest fires, and land use changes.

Objectives, Goals, and Activities:

The goals and activities of the Plan are organized into categories based on the Plan's five objectives:

- Assess and plan for the effects of climate change on current and future responsibilities of the regional office. Category: Assessment
- Identify and implement goals and priority activities that have the highest potential to reduce greenhouse gas emissions. Category: Mitigation
- Identify and implement goals and priority activities that have the highest potential to increase our capacity to adapt to climate variability. Category: Adaptation
- Support our partners in their response to the challenge of climate change through knowledge building, technical assistance, and partnerships. Category: Partnerships
- Demonstrate the specific accomplishments of the Plan. Category: Accomplishments

Currently, there are 21 main goals, under which are 110 activities that stem from nearly every program in the region. These activities range from work in the core program areas to the various climate protection partnership programs. They also include strategic planning efforts that will increase our ability to plan and respond; and prioritize, measure, and evaluate the effectiveness of our actions. Additionally, there are communication and technical assistance activities, as well as future high potential activities that will be implemented as resources or opportunities present themselves.

Implementation:

The Plan will be implemented by staff in various EPA Region 8 Programs throughout the regional office, in coordination with the Region 8 Climate Change Workgroup, Program Managers and Team Leaders, Region 8 Technical Advisors, EPA Headquarters, and EPA's various partners, including States and Tribes. It will be implemented under a set of general principles that will guide the development, prioritization, implementation, and measurement of our goals and activities.

The Plan is meant to be an evolving document, and will be updated on an annual basis through an internal process, as appropriate. Updates will reflect the status and effectiveness of activities, and respond to resource changes, emerging issues, new scientific data and partnerships, and our growing capacity to identify, prioritize, and measure the results of our activities.

III. BACKGROUND

EPA Region 8 is made up of a diverse set of landscapes, population bases, and economic sectors making our response to climate change particularly difficult in its complexity. Our lands are governed by six states, 27 tribal nations, and a host of federal agencies, with 50% of our landmass publicly owned. These entities have diverse and often competing interests that include agriculture, energy development and production, environmental protection and stewardship, industry, recreation, tourism, and urbanism. Our roughly 10 million people[2] are concentrated in two main urban corridors as well as a few isolated cities and towns – often separated by large distances.

A. Observed/Projected Effects of Climate Change:

The Intergovernmental Panel on Climate Change (IPCC) is an international collaborative of scientists and government representatives established to study climate change. They issue periodic reports, the last of which was its Fourth Assessment report in 2007[3]. This report summarizes overwhelming evidence across many scientific disciplines, and concludes that global warming due to human activities since 1750 is unequivocal. The report also indicates that climate variability and warming over the past century has already had measurable effects in the region, including increased temperatures, melting glaciers, reduced snowpack, earlier timing of spring events including snowmelt, poleward and upward shifts in plant and animal ranges, drought, declining forest health, heavy precipitation events, and habitat loss. These effects are expected to intensify as greenhouse gases build up in the atmosphere, and continue to threaten our water resources, agricultural production, forests, wildlife habitats, alpine ecosystems, and human health throughout the 21st century[4]. The situation is complicated by a host of additional challenges, including persistent population growth, urban sprawl, and rapid growth of the energy industry (including mining, oil and gas production, and bio-fuels production) - all of which will strain our ability to respond effectively.

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[2] US Census Bureau, State and County Quick Facts, 2006 data, http://quickfacts.census.gov/qfd/

[3] Intergovernmental Panel on Climate Change, Fourth Assessment Report (IPCC), http://www.ipcc.ch/index.htm

[4] Since the issuance of the April 2, 2007 Supreme Court decision in Massachusetts v EPA, 127 SCt 1438 (2007), EPA has been developing a response to the remand as well as evaluating the broader ramifications of the decision throughout the Clean Air Act (CAA). On July 11, 2008, EPA issued an Advanced Notice of Proposed Rulemaking (ANPR) that, among other things, reviews the various CAA provisions that may be applicable to regulate GHGs, examines the issues that regulating GHGs under those provisions may raise, provides information regarding potential regulatory approaches and technologies for reducing GHG emissions, and raises issues relevant to possible legislation. This Region 8 Climate Change strategy does not reflect, and should not be construed as reflecting, the type of judgment that might form the basis for a positive or negative finding under any provision of the CAA.

More specifically, according to a recent document produced by the U.S. Climate Change Science Program[5]:

- In North America, warming has generally resulted in and is expected to continue to result in shifts of species ranges poleward and to higher altitudes. However, species that require higher-elevation habitat, such as alpine ecosystems, may have nowhere to migrate.
- In the last three decades, the wildfire season in the western United States has lengthened and burn durations have increased. Climate change has also *very likely* increased the size and number of insect outbreaks and tree mortality that help to fuel wildfires in the interior West. These trends are *very likely* to continue.
- With increased carbon dioxide levels and temperature, the lifecycle of grain and oilseed crops will *likely* progress more rapidly. But, as temperatures rise, these crops will increasingly begin to fail, especially if climate variability increases and precipitation lessens or becomes more variable.
- The marketable yield of many horticultural crops (e.g., tomatoes, onions, and fruits) is *very likely* to be more sensitive to climate change than grain and oilseed crops.
- Climate change is *likely* to lead to northward migration of weed species. Increasing carbon dioxide levels are *likely* to help many weeds, particularly some types of invasive weeds, more than most cash crops.
- Shifts in the productivity and type of plants will *likely* also have significant impact on livestock operations. Higher temperatures will *very likely* reduce livestock production during the summer season, but these losses will *very likely* be partially offset by warmer temperatures during the winter season.
- In some mountain areas, earlier snowmelt peaks result in reduced low flows in the summer and fall. Continuing shifts in this direction are *very likely* and may substantially affect the performance of reservoir systems through changes in the seasonality of streamflow.
- It is *likely* that droughts will continue to be exacerbated by this earlier and possibly lower spring snowmelt runoff in the mountainous West.
- Stream temperatures are *likely* to increase as the climate warms and are *very likely* to have effects on aquatic ecosystems and water quality. Changes in temperature will be most evident during low flow periods, when they are of greatest concern.
- Climate and extreme events can have substantial effects on local economies. For example, tourism could be affected by drought-influenced water levels in rivers and reservoirs, cleanup following multiple storm outbreaks, and changes in the length of the tourist season (e.g., ski season and beach season).
- High temperatures tend to exacerbate chronic health conditions. An increased frequency and severity of heat waves is expected, leading to more illness and death, particularly among the young, elderly, frail, and poor. However, climate change is projected to lead to fewer deaths from cold exposure.

[5] U.S. Climate Change Science Program, "Scientific Assessment of the Effects of Global Change on the United States," *A Report of the Committee on Environment and Natural Resources - National Science and Technology Council,* May 2008. The descriptions of likelihood (printed in italics) use the following definitions: *very likely* = 90 to 99% probability, l*ikely* = 66 to 90% probability.

- Climate change is *likely* to increase the risk and geographic spread of vector-borne infectious diseases, including Lyme disease and West Nile virus.
- Increases in extreme weather (e.g., storms, flooding) and accompanying events (e.g., wildfire resulting from prolonged drought) may lead to increases in deaths, injuries, infectious diseases, interruptions of medical care for chronic disease treatment, and stress-related disorders and other adverse effects associated with social disruption and migration.

Despite these challenges, the region holds many unique opportunities for addressing climate change: a high concentration of scientists working in relevant disciplines, a high potential for carbon sequestration, and an abundance of renewable energy resources including solar, geothermal, wind, and biomass.

B. Actions to Address Climate Change:

States, tribes, and municipalities in EPA Region 8 have been proactive in addressing climate change in various ways. Their actions include such things as completing greenhouse gas inventories and climate action plans, passing enabling legislation, and participating in regional initiatives. The Region recognizes and supports the important role of these efforts, and has been reaching out to identify ways in which we can provide assistance and work in collaboration. Where our efforts to address climate change overlap, we will attempt to make our programs compatible and complementary, without being duplicative.

1. Greenhouse Gas Emissions Inventories

Five EPA Region 8 States completed comprehensive greenhouse gas emissions inventories in 2007 through the Center for Climate Strategies[6]. These inventories are based on consumption, and do not include the production of electricity that is exported outside the region. Based on these, and a cursory evaluation of the emissions from the State of North Dakota[7], the following profile emerged:

- The States in EPA Region 8 were responsible for approximately 5.3% of the nation's greenhouse gases in 2005 totaling 362.39 MMtCO2e[8].
- The principal sources of the region's emissions vary by state, but include energy use, transportation, the fossil fuel industry, and agriculture[9].
- The rates of increase in greenhouse gas emissions between 1990 and 2005 for the six Region 8 States were14% for Montana, 25% for Wyoming, 26% for North Dakota, 35% for Colorado, 36% for South Dakota, and 40% for Utah. The national rate of

[6] The Center for Climate Strategies, a nonprofit service organization that works to identify, design, and implement policies that address climate change, completed greenhouse gas inventories for the States of CO, UT, MT, WY and SD based on tools and methodologies developed by EPA. http://www.climatestrategies.us/.
[7] North Dakota data was compiled by the EPA HQ Climate Protection Partnerships Division in the Office of Air and Radiation.
[8] MMtCO2e is defined as million metric tons of carbon dioxide equivalent.
[9] The greenhouse gas emissions from the agricultural sector include enteric fermentation, manure management, soils management, and residue burning.

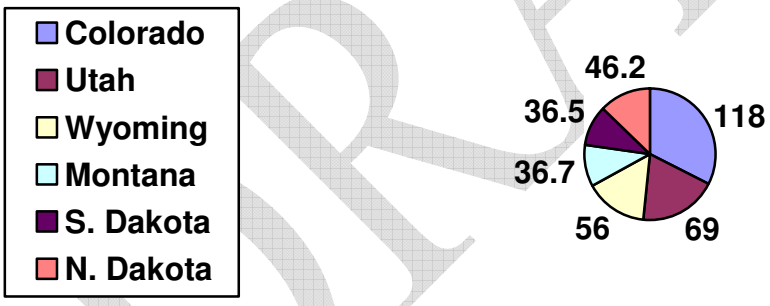
increase over that time period was 16%. The higher rates of increase in five of the six States were due primarily to the demand for energy by a growing population, and growth of the fossil fuel industry.

- In 2005, the average regional per capita emissions were 56 MtCO2e[10], compared to the national average of 25 MtCO2e. This is due to a strong fossil fuel production industry, agricultural intensity, large distances, and low population base.
- The region also has a large carbon sink in its forest biomass, rangelands, and agricultural soils that help balance the region's emissions. In 2005, these sinks offset approximately 110.5 MMTCO2e, or 30% of the region's emissions. However, there is some uncertainty associated with the measurement of these sinks, and the potential for a high rate of flux due to land use changes, forest health, and forest fires.

The following chart shows the gross greenhouse gas emissions by State. Note that these emissions do not include the production of electricity that is exported outside the region, only what is consumed. Another way to view the region's greenhouse gas emissions is to include electricity production in its entirety, which would yield a greater overall greenhouse gas emission total because the region is a net electricity exporter.

EPA Region 8 Gross Greenhouse Gas Emissions by State in 2005

(Consumption-Based in MMT CO2e)



EPA developed the underlying tools and methodology used for these emissions inventories, and maintains energy-related greenhouse gas emissions trends for all states. They are a resource for future updates that will be conducted over time.

2. State Action Plans

Three EPA Region 8 States have recently completed Climate Change Action Plans: Colorado, Utah, and Montana. These plans are summarized below (see Appendix C for more details):

Colorado:

[10] MtCO2e is defined as metric tons of carbon dioxide equivalent

On November 5, 2007, Governor Bill Ritter released the "Colorado Climate Action Plan – A Strategy to Address Global Warming." The Plan's goal is to cut Colorado's greenhouse gas emissions 20% below 2005 levels by 2020 and 80% by 2050. This will be accomplished through a comprehensive set of goals and strategies. Specifically, the Plan directs various State Agencies to take action under the coordination of the Governor's Climate Change and Energy Advisor. These agencies include the Department of Natural Resources, the Department of Public Health and Environment, the Governor's Energy Office, the Colorado Department of Agriculture, and the Colorado Public Utilities Commission.

Utah:

Governor Huntsman organized a Blue Ribbon Advisory Council on Climate Change (BRAC) on August 25, 2006, to identify proactive measures that Utah might take to mitigate the impacts of greenhouse gases. It was charged with considering the science, economics, and policy issues related to climate change. Twenty-four industry, government, community and environmental leaders participated in the effort. The BRAC reported its findings on October 3, 2007, in the "Blue Ribbon Advisory Council on Climate Change – Report to Governor Jon M. Huntsman, Jr." These findings, which are currently being considered by the State, include a broad list of policy options organized under five major sectors: Agriculture/Forestry, Cross-Cutting Issues, Energy Supply, Residential/Commercial/Industrial, and Transportation/Land Use. The goal of these options is to reduce greenhouse gas emissions to 2005 levels by 2020.

Montana:

In 2005, Governor Brian Schweitzer directed the Montana Department of Environmental Quality to establish a Climate Change Advisory Committee (CCAC). The CCAC evaluated greenhouse gas reduction opportunities in various sectors of Montana's economy. In October 2007, they issued their final report, the "Montana Climate Action Plan – Final Report of the Governor's Climate Change Advisory Committee." It includes 54 policy recommendations designed to reduce Montana's greenhouse gas emissions to 1990 levels by the year 2020. These recommendations span various sectors of Montana's economy, including: energy production and use, transportation, land use, agriculture, forestry, and waste management. An additional category entitled "Cross-Cutting Issues" includes recommendations for inventorying, forecasting, reporting, and registering Montana's GHG emissions.

3. Other Actions

Wyoming:

Governor Dave Freudenthal signed into law House Bill 90/HEA 25 (carbon capture and sequestration) and House Bill 89/HEA 18 (ownership of subsurface pore space) on March 4, 2008. HB 90 charges the Wyoming Department of Environmental Quality with

regulating “geologic sequestration” of CO2. Companion bill HB 89 mandates that the surface owner owns below-ground “pore space” in which CO2 might be stored.

Tribes:

Across the country, Native American leaders have been voicing their concerns about the effects of climate change. Many tribes are also pursuing renewable energy projects on their Reservations. In June 2006, the National Congress of American Indians adopted a resolution supporting a national mandatory program to reduce climate change pollution and promote renewable energy. In December 2006, representatives from more than 50 tribes throughout the United States gathered at the Cocopah Reservation in Arizona for a two-day conference on climate change. At a United Nations meeting in June 2007, Native American leaders spoke at a session called "Indigenous Perspectives on Climate Change.” Leading representatives from indigenous and scientific communities took part in a landmark climate change symposium at the National Center for Atmospheric Research (NCAR) in Boulder, CO in March 2008.

4. The Climate Registry

On May 8, 2007, more than 30 entities signed on as charter members of The Climate Registry, a collaboration between states, provinces and tribes aimed at developing and managing a greenhouse gas emissions reporting system. In Region 8, the States of Utah, Wyoming, Colorado, and Montana are now members, as is the Southern Ute Indian Tribe. The Registry will serve as a tool to measure, track, verify and publicly report greenhouse gas emissions.

5. Western Climate Initiative

The Western Climate Initiative is a collaboration that was launched in February 2007 to address regional challenges raised by climate change, including a regional cap and trade program. There are nine partners in the Initiative, including the States of Utah and Montana. Other states and provinces have joined as observers, including the States of Colorado and Wyoming.

6. Mayors Climate Protection Agreement

As of May 2008, 852 Mayors from across the United States had signed on to the Mayors Climate Protection Agreement, including 28 in EPA Region 8. Each Region 8 State has at least one signatory. The Agreement is a commitment to meet or beat the Kyoto Protocol target through various community actions. It also urges states and the federal government to take action to reduce greenhouse gas emissions.

7. Participation in EPA’s Voluntary Partnership Programs

Organizations and businesses in the region are also taking actions to address climate change through participation in various EPA voluntary partnership programs, including the following: ENERGY STAR®, Climate Leaders, the Green Power Partnership, the Combined Heat and Power Partnership, Natural Gas STAR, WasteWise, the Federal Electronics Challenge, and the Coal Combustion Products Partnership. Some of these partnership programs have a significant amount of regional participation.

8. ICLEI's Cities for Climate Protection Campaign

Cities for Climate Protection® (CCP) is ICLEI's flagship campaign. The program is designed to educate and empower local governments worldwide to take action on climate change. CCP is a performance-oriented campaign that offers a framework for local governments to reduce greenhouse gas emissions and improve livability within their municipalities. As of May 2008, there were eight participants in EPA Region 8.

IV. EPA'S ROLE IN CLIMATE CHANGE

EPA has been addressing climate change for over a decade through its voluntary partnership programs and other efforts, achieving greenhouse gas reductions through waste reduction, recycling, methane capture and use, sustainable development, water conservation, green building, research, technology development, grants, remediation, revitalization, education, enforcement, technical assistance, partnerships, and international capacity building. EPA is also developing plans and tools that address adaptation needs stemming from climate-induced changes to the environment.

EPA Administrator Stephen Johnson issued a draft working paper on energy and climate declaring "Clean Energy and Climate Change" as a priority, with the goal of helping America use energy more efficiently and affordably, speeding the transition to cleaner energy sources, improving energy security, and reducing greenhouse gases. A number of regional offices have also declared clean energy/climate change as a priority, and have appointed staff to coordinate efforts in this area.

EPA's role in climate change is expanding. For example, new rulemakings are being developed related to the underground injection of CO2, and a national greenhouse gas reporting program for all sectors of the economy. Additionally, on July 11, 2008, Administrator Johnson signed an Advanced Notice of Proposed Rulemaking (ANPR) regarding regulation of greenhouse gas emissions. The ANPR reviews the various CAA provisions that may be applicable to regulate GHGs, examines the issues that regulating GHGs under those provisions may raise, provides information regarding potential regulatory approaches and technologies for reducing GHG emissions, and raises issues relevant to possible legislation. In addition, the ANPR describes and solicits comment on petitions EPA has received to regulate GHG emissions from ships, aircraft and nonroad vehicles such as farm and construction equipment. Finally, the ANPR discusses several other actions concerning stationary sources for which EPA has received comment regarding the regulation of GHG emissions.

EPA is also conducting economic analyses of national climate bills pending in Congress upon request, and participating in the Administration's "Major Economies Initiative" to bring together global leaders to address energy security and climate change after the Kyoto Protocol targets expire in 2012.

V. IMPLEMENTATION OF THE PLAN

A. Roles and Responsibilities:

The Plan will be implemented by staff in various EPA Region 8 Programs throughout the regional office consistent with the goals and objectives of Program Managers. Final approval of the Plan and its revisions, as well as decision-making related to policy and high visibility projects, will come from the Regional Senior Leadership Team. It will be coordinated by the Region 8 Climate Change Workgroup under the purview of the Region 8 Climate Change Coordinator. EPA Headquarters will provide oversight and technical assistance, as necessary, and has the lead on most of the Climate Protection Partnership Programs. Implementation will frequently involve interaction with EPA's partners, including: state and local government, tribes, universities and research institutions, trade and professional associations, other federal agencies, industry, vendors, and environmental organizations.

The Climate Change Workgroup will coordinate with the Region 8 Energy, Agriculture, Revitalization, and Science Advisors on overlapping goals, activities, and planning efforts, as well as Program Managers, Team Leaders, Coordinators, Attorneys, and Staff in many program areas.

B. General Principles:

The Plan will be implemented under a set of general principles that will guide the development, prioritization, implementation, and measurement of our goals and activities. These principles include:

- Consider activities under the umbrella of sustainability, which is to be further defined for specific activities.
- Provide cross coordination among programs through the Climate Change Workgroup and other means.
- Analyze solutions using lifecycle analysis and systems thinking.
- Prioritize activities based on impact potential, co-benefits, and leveraging opportunities.
- Measure benefits of activities and report results.
- Consider the human health and welfare impacts of climate change and disproportionate impacts.
- Consider a full scope of activities along a continuum from regulatory to voluntary to incentive-based options.

Continuum of Activities Related to EPA's Regulatory and Voluntary Programs

C. Plan Updates and Reports:

The Plan will be updated annually, as appropriate, through an internal process to reflect the status and effectiveness of activities, and respond to resource changes, emerging issues, new scientific data and partnerships, and our growing capacity to identify, prioritize, and measure the results of our activities.

VI. ALIGNMENT WITH EPA PLANS AND COMMITMENTS

The goals and activities in the Plan are aligned with the Agency's multi-year strategic plan and annual performance plan, as well as with Region 8's 2008 RAC (Regional Administrator's Commitments) as discussed in the following paragraphs. These alignments will be modified based on national policy, goals, or objectives.

1) *2006 – 2011 EPA Strategic Plan: Charting Our Course*, 09-30-06

Goal 1: Clean Air and Global Climate Change
Objective 1.1 Healthier Outdoor Air
Objective 1.5 Reduce Greenhouse Gas Emissions

This goal and its objectives are supported by the Plan directly through numerous activities related to energy efficiency, clean energy and fuels, renewable energy, "green practices" such as idle reduction strategies, and technology improvements, as well as indirectly through activities related to materials management, water conservation and efficiency, and watershed management.

Goal 2: Clean and Safe Water
Objective 2.2 Protect Water Quality

This goal and objective are supported by the Plan directly through activities related to storm water runoff, and indirectly through activities related to watershed protection and water resource planning.

Goal 3: Land Preservation and Restoration
Objective 3.1.1 Reduce Waste Generation and Increase Recycling

This goal and objective are supported by the Plan indirectly through waste reduction and recycling activities that divert waste from landfills and reduce methane emissions.

Goal 4: Healthy Communities and Ecosystems
Objective 4.2 Communities
Objective 4.2.3 Assess and Cleanup Brownfields

This goal and its objectives are supported by the Plan directly through "green cleanup" activities on Brownfields sites, and indirectly through numerous activities related to energy and water conservation and efficiency, as well as sustainable infrastructure and watershed management/protection - both of which lead to enhanced abilities by communities to provide vital services to their residents.

Goal 5: Compliance and Environmental Stewardship
Objective 5.2 Improve Environmental Performance through Pollution Prevention and Other Stewardship Practices
Objective 5.2.1 Prevent Pollution and Promote Environmental Stewardship

This goal and its objectives are supported by the Plan directly through activities that increase materials efficiencies and reduce the generation of greenhouse gases through product development. The Plan also supports this goal indirectly through waste reduction activities that divert waste from landfills and reduce methane emissions.

2) *FY 2008 Annual Performance Plan*

The Plan directly supports the FY 2008 annual performance goals and measures related to **Clean Air and Global Climate Change** in the following two areas: Healthier Outdoor Air and Reduced Greenhouse Gas Intensity. This is being accomplished through the air program activities and the voluntary climate protection programs.

3) *EPA Region 8 RAC 08 (Regional Administrator's Commitments)*

The Plan has a nexus with the RAC 08 in the following areas: The development and implementation of the Plan, support to States, the Sustainable Infrastructure Program, biofuels, and green venues.

VII. GOALS AND ACTIVITIES

The goals and activities presented below are organized into categories based on the Plan's objectives, as follows:

A. **Assessment:** Assess and plan for the effects of climate change on current and future responsibilities of the regional office.
B. **Mitigation:** Identify and implement goals and priority activities that have the highest potential to reduce greenhouse gas emissions.
C. **Adaptation:** Identify and implement goals and priority activities that have the highest potential to increase our capacity to adapt to climate variability.
D. **Partners:** Support our partners in their response to the challenge of climate change through knowledge building, technical assistance, and partnerships.
E. **Accomplishments:** Demonstrate the specific accomplishments of the Plan.

More details about the specific activities can be found in Appendix A: Region 8 Climate Change Activities Matrix – 2008 update. These details include the responsible office and contact, the activity's priority and timeframe, key partners, measures and directives, and the FTE used to implement the activity.

ASSESSMENT

A. Assess and plan for the effects of climate change on current and future responsibilities of the regional office.

This section includes assessment and planning activities to increase our understanding of, and response to, the effects of climate change on human health, the environment, our infrastructure, the economy, our way of life, our regional operations, and our regulatory responsibilities in EPA Region 8.

Goal A.1 Conduct Activities to Increase Knowledge and Ability to Respond.

a. Climate Change Workgroup Members will work with their respective programs to assess the effects of climate change on their current and future responsibilities, as well as their role in mitigation, adaptation, and communication activities.
b. The Climate Change Workgroup will share critical programmatic information among its members, and provide cross-program coordination. Key policy-making and high profile decision-making will be elevated to the Senior Leadership Team.
c. Develop indicators of the effects of climate change in the Region, including environmental, health, and economic. Track regional trends in coordination with states, tribes, research scientists, federal agencies, and others who have on-the-ground knowledge and monitoring capabilities.
d. Develop a methodology for prioritizing the Plan's activities, including the identification of activities that have the highest potential to reduce greenhouse gases and increase our capacity to adapt.

Goal A.2 Evaluate the types of disaster events that might occur as a result of climate change and prepare a coordinated response.

a. Research available data on projected disaster events related to climate change, and evaluate how they might translate into regional effects.
b. Coordinate with the emergency response community to evaluate the results of the research, and prepare a response plan.

Goal A.3 Evaluate the human health and welfare impacts of climate change and prepare a coordinated response.

a. Research available data on projected health and welfare implications of climate change, and evaluate how they might translate into regional effects. Coordinate with the EPA Office of Children's Health Protection and the Office of Research and Development.
b. Coordinate with the public health community to evaluate the results of the research, and prepare a response plan.

Mitigation

B. Identify and implement goals and priority activities that have the highest potential to reduce greenhouse gas emissions.

This section includes current goals and activities directly and indirectly related to the reduction of greenhouse gases. It also includes future high potential activities identified by various program areas that will be implemented as resources or opportunities present themselves.

Goal B.1 Increase energy efficiency in the residential, commercial and industrial sectors.

a. Provide support to builders, developers, and other partners in Region 8 States to increase the number of ENERGY STAR® Qualified New Homes.
b. Promote ENERGY STAR in new affordable housing in Colorado and Utah in 2008 through state and local affordable housing organizations.
c. Provide technical assistance to the ENERGY STAR for Multi-Family pilots in Fort Collins and Denver, Colorado in 2008.
d. Provide support to "Home Performance with ENERGY STAR Program" sponsors in Colorado (Colorado Springs, Boulder, Fort Collins) and Wyoming (Laramie, Cheyenne) in 2008.
e. Promote the use of ENERGY STAR benchmarking tools through outreach, training, and technical assistance to existing building owners and operators.
f. Promote the use of ENERGY STAR commercial building design in Colorado, Utah and Montana in 2008 through outreach and training for architects, engineers, and building owners.
g. Promote the ENERGY STAR Challenge Campaign through the National Association of Manufacturers Regional Centers, and provide recognition to

industrial plants that are awarded the ENERGY STAR label through press events.

h. Promote the use of ENERGY STAR consumer products through various ENERGY STAR national campaigns (Change A Light, Low Carbon IT, Build A Better World 10% At A Time) with various partners through press releases, articles, and events.

i. Encourage current Performance Track members who are renewing, as well as new members, to commit to reducing greenhouse gas emissions as one of their future commitments.

j. Work with the oil and gas industry through the Natural Gas Star program and State Environmental Departments and State Oil and Gas Commissions to minimize methane emissions from production operations while maximizing gas-to-market.

k. Support the adoption and use of cost-effective technologies and management strategies to enhance energy efficiency at water and wastewater utilities through the Sustainable Infrastructure Program. Support shall include outreach, training, workshops, and incentives. Coordinate with the ENERGY STAR Program.

l. Conduct a regional Sustainable Infrastructure Forum in 2008, co-hosted with Region 6, to begin to identify region-specific issues, challenges, and barriers to achieving sustainable infrastructure. The outcome of this forum will be used to refine and further develop the Sustainable Infrastructure Energy Management Handbook and Guidelines.

m. Provide ENERGY STAR Benchmarking tools and financial training to wastewater treatment plants through municipalities, townships, service and product providers, utilities and trade organizations. Coordinate with the Sustainable Infrastructure Program.

Goal B.2 Increase fuel efficiency, and the production and use of clean energy and alternative fuels.

a. Explore options for regional participation in the Green Power Partnership.

b. Oversee Environmentally Responsible Redevelopment and Reuse Program (ER3) projects as they become available to the region, and share successes.

c. Work with the oil and gas industry through the Natural Gas Star program and State Environmental Departments, as well as State Oil and Gas Commissions and DOE, to minimize fuel gas use in production operations.

d. Promote and help implement OSWER and R8 initiative for placing renewable energy at contaminated sites.

e. Sign up at least one new SmartWay Partner in EPA Region 8 in FY08.

f. Advertise new grant funding available under the Diesel Emissions Reduction Act (DERA) to ensure that EPA receives a large number of high-quality applicants from entities located in EPA Region 8.

g. Award and manage new clean diesel grants (under the DERA) that have various project goals, including equipment retrofits, efficiency measures, and replacing regular diesel with biodiesel.

h. Manage existing Clean School Bus (CBS) and National Clean Diesel Campaign (NCDC) grants that have various project goals, including equipment retrofits, efficiency measures, and replacing regular diesel with biodiesel.

i. Expand the Rocky Mountain Clean Diesel Collaborative (RMCDC) membership by advertising the Collaborative. Hold meetings of the Collaborative every other month.

j. Educate other EPA offices about the importance of incorporating clean diesel practices and measures (including the use of biodiesel) into their grants and/or contracts to the extent practicable. This would include the Brownfields and Superfund programs and could include all EPA grants.

Goal B.3 Reduce greenhouse gas emissions through work in the core program areas.

a. Air:

a.1) Look for opportunities to encourage overall reductions in greenhouse gas emissions during implementation of the Clean Air Act (CAA) National Ambient Air Quality Standards (NAAQS) State Implementation Plan (SIP) requirements for the $PM_{2.5}$ 24-hour NAAQS and the revised 8-hour Ozone NAAQS.

a.2) Look for opportunities to encourage overall reductions in greenhouse gas emissions during implementation of the CAA Regional Haze SIPs.

b. Water: Participate on a workgroup through the Office of Water OGWDW Program to propose and finalize rules for underground injection of CO2 to ensure the safeguarding of drinking water where commercial scale carbon sequestration is employed.

c. Ecosystem Protection: Participate on a national workgroup to finalize the Office of Water Climate Change Mitigation/Adaptation Strategy.

d. Brownfields:

d.1 Continue to encourage the preservation or creation of carbon sequestering green spaces by increasing the weight of grant selection criteria that emphasize the creation of, preservation of, or addition to a park, a greenway, undeveloped property, recreational property, or other property used for nonprofit purposes.

d.2 The Brownfield's Program will incorporate *new* grant guideline language to encourage the use of "green cleanup" practices (e.g. diesel emission reduction and idle reduction strategies) at Brownfield cleanups to reduce greenhouse gas emissions during the construction phase of Brownfield projects.

e. Superfund:

e.1 Work with Remedial Project Managers to identify 2 current construction sites this summer FY08 for possible use of cleaner fuel and or alternative technologies.

e.2 Implement contract modifications in FY 2010 and FY2013 for solicitation packages to include the use of clean fuels and alternative technologies.

f. Enforcement:

f.1) Look for opportunities in enforcement actions to obtain commitments for greenhouse gas reductions through such measures as the installation of renewable energy; energy efficiency upgrades in commercial buildings, industrial facilities, and homes; and upgrades to thermal and generation efficiency at

existing power plants through the use of combined heat and power, and combined cycle processes.

f.2) At a state's request, the compliance group will review and comment on implementation of new state regulations and policies related to greenhouse gas emissions.

f.3) Gain knowledge and expertise on algae farms and other emerging control technologies for future SEP projects.

g. NEPA: Through NEPA reviews, pursuant to EPA's authority under Section 309 of the Clean Air Act, as appropriate, Region 8's comments provide that greenhouse gas-emitting projects subject to NEPA should disclose projected greenhouse gas emissions (in annual CO2 equivalents and over the lifetime of the project); translate the emissions into relevant equivalencies that are understandable to the public in relation to other greenhouse gas sources; describe the contribution of the project's greenhouse gas emissions to global temperature increase, including in the context of cumulative impacts; describe the project's emissions in the context of total greenhouse gas emissions at regional, national and global scales; describe generally, the environmental impacts of climate change based on current scientific knowledge; and discuss means to mitigate project-related emissions as appropriate pursuant to CEQ regulations (40 CFR Sections 1502.14(f), 1502.16(h), 1508.14). In addition, as appropriate, Region 8 may recommend that NEPA analyses analyze how global warming may affect the viability of a proposed project and relevant discussion of project adaptation measures.

h. Waste: No direct nexus under this goal (see Goal B.4 below).

Goal B.4 Conserve natural resources and energy by managing materials more efficiently.

a. Provide Resource Conservation Challenge (RCC) Program grants through a competitive process to grantees to achieve various goals related to the Program such as landfill diversion and materials efficiency.

b. Promote reductions in municipal solid waste in the State of Colorado through the Pay As you Throw Program under the Resource Conservation Challenge (RCC). Provide technical assistance to municipalities by conducting workshops on the Program's features and benefits.

c. Recruit and mentor Region 8 Federal Facilities to become Federal Electronics Challenge partners.

d. Expand partnerships in the Coal Combustion Products Partnership (CP2) Program with industry, states, academia, and/or other entities to increase the recycling of coal combustion products in Region 8 and reduce greenhouse gas emissions.

e. Provide forums for the exchange of information about industrial materials recycling, including conferences and workshops among regulators, industry, and other stakeholders.

f. Develop and host the 2008 Beneficial Use of Industrial Materials Summit in Denver, Colorado on March 31 – April 3, 2008.
g. Identify and work on a major construction project(s) with developers, builders, and others who influence materials use and encourage recycling of coal combustion products and construction and demolition materials to support EPA's Construction Initiative
h. Explore area partnerships, such as with the City of Denver's Greenprint Program, to support their goals for city green building policy and high performance buildings, reducing greenhouse gas emissions, and promoting green industry economic development; promote and develop additional strategies to meet the city's sustainability goals and EPA's Industrial Materials Recycling Program goals.
i. Continue work with the Pepsi Center to promote the goals of the Green Venues Initiative, then expand in to the hospitality sector including restaurants, hotels, meeting planners, and caterers. This work will eventually include efforts with other large venues in the Denver area.
j. Promote the WasteWise Program to the hospitality industry in Colorado to reduce the generation of waste, increase recycling, and the purchase of recycled products through workshops jointly sponsored by EPA and the industry.

Goal B.5 Increase water efficiency and conservation in the residential, commercial, and industrial sectors.

a. Support demand-side water efficiency and conservation through the Sustainable Infrastructure and WaterSense Programs by encouraging the distribution and use of water-efficient products, the development of WaterSense model communities, and other outreach efforts.
b. Support supply-side water efficiency through the Sustainable Infrastructure Program by encouraging the use of EPA's Conservation Guidelines (1998) to extend the value and life of infrastructure assets, and by encouraging states to promote water efficiency through implementation of CWSRF Policy Memorandum 00-13 and DWSRF Policy Memorandum 03-03.

Goal B.6 Provide leadership by reducing greenhouse gas emissions from internal operations.

a. Integrate and implement applicable EPA voluntary programs with Region 8's Environmental Management System (EMS) and Leadership in Energy and Environmental Design for Existing Building (LEED EB) certification via a cohesive, region-wide strategy. Use the building as a teaching tool for green building. Promote EMS and green building principles and behavioral change among R8 staff and the public. Establish baseline data, measure and report the environmental performance of the building's sustainable features in preparation for the ENERGY STAR label in 2009 and for LEED EB certification in 2011.

b. Achieve and maintain Federal Electronics Challenge (FEC) Partner Gold Award level at the Regional Office in partnership with the Region 8 FEC implementation team and FEC Champions across the nation.

c. Re-sign the regional office to WasteWise, and then define goals and activities related to waste reduction, recycling, and buying recycled products. Pilot a waste reduction program in the regional office related to the desk-side pickup of trash vs. recyclables.

d. Utilize the vegetated roof as a teaching tool and a working laboratory to promote application and expansion of the technology. Research green roof effectiveness in mitigating urban heat island and stormwater runoff effects. Research the viability of different plant and media mixes. Develop design criteria for green roof design and installation through local flood control districts. Provide research data, tours, and advice to interested parties.

Goal B.7 Reduce greenhouse gas emissions and enhance carbon sequestration in the agricultural sector.

a. Promote the use of anaerobic digesters and the reuse of digester gases through the Ag Star Program and the Colorado digester initiative.

b. Promote sustainable agriculture and best management practices to various partners through State partners, the EPA Office of Research and Development, USDA, and Colorado State University.

Goal B.8 Build internal knowledge of climate change science, mitigation, and adaptation.

a. Provide opportunities for the Region 8 staff to increase their knowledge of various climate change issues through conference calls, webcasts, speaking events, workshops, meetings, and/or research materials.

b. Develop a "Knowledge Building Series" of handouts on various topics of interest to the region ranging from basic information on climate change to more technical topics such as carbon sequestration.

Goal B.9 Build external knowledge of climate change science, mitigation, and adaptation.

a. Develop a Climate Change Communication Strategy to guide our efforts to build knowledge of climate change in EPA Region 8.

b. After developing the "Knowledge Building Series," share through the Region 8 website and other outreach activities.

c. Train personnel in the regional office through the Ambassador's Program to deliver presentations on climate change, and mobilize them to various audiences.

d. Participate in various outreach activities such as Earth Day, Public Health Week, and conferences, and share information on the EPA R8 Website.

Goal B.10 Future High Potential Activities.

a. Identify key greenhouse gas emitting sectors, and target them through various EPA Climate Protection Partnerships and other measures.
b. Increase the installed capacity for cogeneration through the Combined Heat and Power Partnership.
c. Calculate greenhouse gas emissions data on an ecosystem-wide basis. Transfer the protocol developed for the Greater Yellowstone Area to the San Luis Valley ecosystem.
d. Continue providing grants through the Resource Conservation Challenge to further the goals of the Program.
e. Promote the goals of the Green Venues Initiative to other sectors, including municipalities.
f. Set up a food waste collection program for management in anaerobic digesters with recovery of energy, and with residuals put into a composting program.
g. Develop and plan a workshop for Departments of Transportation and Departments of Environment Quality in 2008 or early 2009 to present the results of the Colorado Department of Transportation's "alternative materials use in highways research," as well as other relevant and useful topics to promote industrial materials recycling and its benefits in Region 8.
h. Promote the WasteWise Program to the hospitality industry in the other Region 8 States to reduce the generation of waste, increase recycling, and the purchase of recycled products through workshops jointly sponsored by EPA and the industry.
i. Implement the WasteWise goals and activities in the regional office and stay abreast of the recycling options available to the regional office through the recycling hauler.
j. Support terrestrial carbon sequestration partnerships and opportunities in high potential areas such as reclamation sites, beetle kill areas, and the San Luis Valley.
k. Explore partnerships with the City of Denver, University of Colorado Denver, and the Built Green Colorado Program to incorporate more beneficial use of industrial materials in projects across the state. Management support needed.
l. Work with developers, builders, and others who influence materials use on the Union Station redevelopment project to encourage recycling of coal combustion products, construction and demolition materials, and other materials to support EPA's Construction Initiative.
m. Partner with the Colorado Department of Transportation (CDOT) to increase the beneficial use of industrial materials in transportation projects across the State.
n. Support the development of algae farms for the production of biofuels through various funding mechanisms.
o. Work with WRAP through state greenhouse gas emissions inventories to support the development of methodologies for sources of VOCs in upstream oil and gas activities from which credible estimates of methane emissions can be derived.

p. Increase the number of Diesel Emission Reduction Act (DERA) Grants and Rocky Mountain Clean Diesel Collaborative projects as additional funding becomes available.
q. Per the Region 8 Agriculture Strategic Plan, pursue partnerships with State Programs, the USDA, the new Agriculture FACA, and others, as well as biofuels research.

ADAPTATION

C. Identify and implement goals and priority activities that have the highest potential to increase our capacity to adapt to climate variability.

Goal C.1 Initiate forums to consider holistic and comprehensive approaches to the management of our water resources to protect water quality and human health in response to the negative effects of climate change.

a. Encourage the adoption of watershed/aquifer management principles, including tools that consider groundwater and wetlands, through outreach and technical support to key EPA, State and other federal decision-makers to increase the ability of water managers and municipalities to respond to climate change.
b. Support adaptation in water resource planning efforts through collaborative dialogues with municipal officials, land-use planners, developers, water managers, and other stakeholders to protect long-term water availability and quality for all end users.
c. Cooperate with organizations such as the Western Water Policy Program at the Natural Resources Law Center, American Water Works Association, the Colorado SWSI and the Climate Change and Western Water R&D Group to explore ways to mitigate adverse water quality impacts and adaptation methodologies.

Goal C.2 Manage storm water to reduce runoff in urban areas from high intensity storm events.

a. Work with all regulated municipalities (generally greater than 10,000 people) to ensure they have procedures and policies to retain/detain/infiltrate flows from new impervious surfaces greater than one acre to reduce pollutant loading and flow-related pollution.
b. Work with regulated federal facilities on construction of facilities with a footprint greater than 1 acre to ensure the facilities are designed, planned and constructed to manage storm water through low-impact procedures and vegetation to reduce pollutant loading and flow-related pollution.
c. Encourage all construction on federal facilities with a footprint greater than 5,000 sq. ft. to be designed, planned and constructed to manage storm water through low-impact procedures and vegetation to reduce pollutant loading and flow-related pollution.

PARTNERSHIPS

D. Support Our Partners in Their Response to the Challenge of Climate Change through Knowledge Building, Technical Assistance, and Partnerships.

The initial focus of this section is to work with EPA Region 8 partners who are responding to the challenge of climate change in various ways.

Goal D.1 Provide technical assistance to state and tribal agencies that have a role in climate change mitigation and adaptation.

a. Work with various agencies in the State of Colorado to implement the goals of the Colorado Climate Action Plan.
b. Work with the State of Utah to implement the recommendations of the Governor's Blue Ribbon Advisory Council on Climate Change.
c. Work with the State of Montana to implement the recommendations of the Governor's Climate Change Advisory Committee.
d. Evaluate the relative goals of the Colorado, Utah, and Montana climate action plans for synergy and transferability.
e. Provide outreach to agencies in the States of Wyoming, North Dakota and South Dakota regarding climate change mitigation and adaptation, and the tools, resources, and expertise that EPA has to offer.
f. Provide outreach to tribal agencies regarding climate change mitigation and adaptation, and the tools, resources, and expertise that EPA has to offer.
g. Provide updates to states and tribes on EPA's policy advances, rulemakings, tools, resources, and training opportunities through various outreach mechanisms.

Goal D.2 Provide technical assistance to municipalities to encourage local actions to address climate change.

a. Coordinate a meeting of the Region 8 municipalities that are signatories to the Mayors Climate Protection Agreement to share best practices and lessons learned.
b. Form partnerships with various organizations to support programs and initiatives that address climate change at the local level.
c. Provide updates to municipalities on EPA's policy advances, rulemakings, tools, resources, and training opportunities through various outreach mechanisms.

Goal D.3 Provide technical assistance to our federal partners under the directive of Executive Order 13423.

a. Develop an ecosystem-wide protocol for greenhouse gas emission analysis for U.S. Forest Service and National Park Service lands and operations in partnership with EPA Headquarters, the U.S. Forest Service Region 2, the Intermountain Region of the National Park Service, and the National Renewable Energy Laboratory.
b. Develop a greenhouse gas emissions baseline for the Greater Yellowstone ecosystem in partnership with the National Park Service.
c. Assist the EPA Climate Leaders Program in developing guidance that meets the needs of federal partners, using the U.S. Forest Service as the pilot.

Goal D.4 Provide outreach to Region 8 Tribes to share knowledge of climate change and opportunities to address it.

a. Explore opportunities to share indigenous perspectives on climate change with various stakeholders.
b. Support collaborative efforts to engage tribes in climate change research, regional initiatives, renewable energy development, and participation in carbon trading markets.

ACCOMPLISHMENTS

E. Demonstrate the specific accomplishments of the Plan.

Goal E.1 Ensure Region 8 greenhouse gas emissions data is periodically updated and kept relevant.

a. Work with EPA Headquarters, the Region 8 States, and other relevant organizations to ensure emissions data is updated to support climate action plans, including an evaluation of the efficacy of carbon sinks.
b. Work with EPA Headquarters to break out regional greenhouse gas reductions from their national databases for the various Climate Protection Partnership Programs.

Goal E.2 Evaluate and report the effectiveness of the Plan in meeting its goals and objectives.

a. Develop a methodology to evaluate the accomplishments of the Plan based on greenhouse gas emissions data and other indicators of the effects of climate change. Include ground rules, commitments, and expectations.
b. Produce an annual report discussing the accomplishments of the Plan based on the methodology developed in E.2.a, including impacts on regional climate change trends. Present the information in equivalencies that are meaningful to Region 8 Staff, our Partners, and the public.

Goal E.3 Update the Plan on an annual basis.

a. Update the Plan annually, as appropriate, through an internal process to reflect the status and effectiveness of activities, and respond to resource changes, emerging issues, new scientific data and partnerships, and our growing capacity to identify, prioritize, and measure the results of our activities.

VIII. RESOURCES FOR CLIMATE CHANGE INFORMATION

Key Resources:

The following key sources of climate change information provide a variety of up-to-date information ranging from science and policy, to state and local actions to address climate change:

1) IPCC Fourth Assessment Report

The IPCC was established to provide decision-makers and others interested in climate change with an objective source of information about climate change. The IPCC does not conduct any research nor does it monitor climate related data or parameters. Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change. Note that the Working Group 2 report has a section that is specific to North America. Specifically see section 14.4: Key Future Impacts and Vulnerabilities. http://www.ipcc.ch/index.htm

2) U.S. Environmental Protection Agency:

EPA has numerous tools, resources, and programs related to climate change. Various EPA websites offer comprehensive information for individuals, businesses, state and local governments, and communities. They provide information related to climate change science, policy, health effects, mitigation, and economics. EPA's Climate Protection Partnership Programs cover a variety of sectors including agriculture, industry, power generation, transportation, waste management, the built environment, and communities. Through these voluntary partnerships, EPA is achieving a variety of goals including reductions in greenhouse gases, improved air quality, and economic growth. EPA's Clean Energy-Environment State and Local Program assists state and local governments by providing technical assistance, analytical tools, and outreach support. This program analyzes and documents cost-effective policies, initiatives, programs, and best practices that promote renewable energy, energy efficiency, and clean technologies. EPA's "Adopt Your Watershed" campaign challenges citizens and organizations to protect and restore our valuable rivers, streams, wetlands, lakes, ground water, and estuaries. It is a resource for information and references related to local watersheds.
http://www.epa.gov/climatechange

3) U.S. Climate Change Science Program:

The Climate Change Science Program (CCSP) integrates federal research on climate and global change, as sponsored by thirteen federal agencies and overseen by the Office of Science and Technology Policy, the Council on Environmental Quality, the National Economic Council and the Office of Management and Budget. During the past thirteen years the United States, through the U.S. Global Change Research Program (USGCRP), has made the world's largest scientific investment in the areas of climate change and global change research -- a total investment of almost $20 billion. Recent products of interest include:

- *Synthesis and Assessment Product 4.3 (SAP 4.3): The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*
- *Scientific Assessment of the Effects of Global Change on the United States*
- *Revised Research Plan for the U.S. Climate Change Science Program*

http://www.climatescience.gov/

4) National Oceanic and Atmospheric Administration (NOAA):

The Climate Analysis Branch (CAB) at the National Oceanic and Atmospheric Administration (NOAA) strives to advance national capabilities to interpret the causes of observed climate variations, and to apply this knowledge to improve climate models and forecasts and develop new climate products that better serve the needs of the public and decision-makers. http://www.cdc.noaa.gov/

Other Resources:

The following are other sources of climate change information that provide regionally specific data and information on state activities:

1) Pew Center on Global Climate Change:

The Pew Center on Global Climate Change brings together business leaders, policy makers, scientists, and other experts to bring a new approach to the complex and often controversial issue of climate change. They have information related to state activities, including some in EPA Region 8. http://www.pewclimate.org/

2) Western Water Assessment (WWA):

This organization has multiple products related to climate change, including recent stream flow data and the Intermountain West Climate Summary.
http://wwa.colorado.edu/current_projects/

3) Intermountain West Climate Summary:

The Intermountain West Climate Summary is a product designed to provide the latest climate information in a simple compact document aimed at water managers. They

(who is “They”?) provide climate information for the intermountain west in the form of graphics, current conditions, forecasts, verifications, and focus articles. http://wwa.colorado.edu/products/forecasts_and_outlooks/intermountain_west_climate_summary/

4) The Rocky Mountain Climate Organization:

The Rocky Mountain Climate Organization’s mission is to spread the word about climate disruption and how it can impact the Rocky Mountain region. The Organization convened the Colorado Climate Project. http://www.rockymountainclimate.org/

They have four reports of interest:

- *Hotter and Drier – The West’s Changed Climate*
- *Less Snow – Less Water – Climate Disruption in the West*
- *Losing Ground – Western National Parks Endangered by Climate Disruption*
- *Emerging Issues for Water in the West – 21st Century Drought*

5) Center for Climate Strategies

The Center for Climate Strategies enables governors and other state leaders to develop statewide climate action plans with comprehensive policy solutions, broad bipartisan stakeholder support, and successful implementation. The Center has assisted some of our states in the development of greenhouse gas emissions inventories. http://www.climatestrategies.us/