IMPACTS OF CLIMATE CHANGE ON AIR QUALITY IN THE PACIFIC SOUTHWEST

Summary of Major Themes for Future Work and Collaboration

Co-Benefits/Tradeoffs of Climate Change and Air Quality Policy/Technology Choices

- **Identify co-benefits or trade-offs of climate change and air quality policy/technology choices.** [note: comments made numerous times are in bold]
- We need to avoid pitting climate change regulation against criteria pollutant control.
- Multi-pollutant planning for climate change and air quality issues.

Regional/Local Air Quality Impacts from Climate Change

- **We need to understand the specific regional texture of impacts.** Specific questions include:
  - Which areas will experience AQ improvements and which deterioration due to climate change alone?
  - Which areas will be pushed into non-attainment due to the climate penalty?
  - What is the magnitude of the "climate penalty" for air quality in specific areas?
- What is the impact of climate change on background ozone levels? Increases in background ozone levels due to climate change could create air quality issues in areas with few or no pollution sources.

Compare Climate Change to Other Impacts on Air Quality

- What is the impact of climate change relative to emissions changes (due to controls, land use change, and socioeconomic changes)?

Particulate Matter and Other Non-Ozone Pollutants

- **Resolve uncertainty with mixed impacts of PM on climate and visibility.**
- Which components of PM are most important for public health and/or climate impacts?
- PM-10 is considered a major problem for Western states – more research on how climate change will affect dust and fires is needed.
- Assess extent of interannual variability in PM predictions.
- Fire: Need to assess and develop control strategies (e.g., controlled burning) and fire management tools (such as WALTER).
- Evaluate impacts of climate change on non-criteria pollutants. For example, increasing temperatures increases crop pests, which in turn increases the need for more pesticides

Human Health Impacts

- We need to develop meaningful and measurable health data for climate change impacts on air quality.

Information Sharing and Management

- **Need better data sharing opportunities and mechanisms.**
- Need to manage emissions and adaptation data.

Social Science: Economics, Communication, Social Marketing, etc.

- We need on-going research on economics, socioeconomics (including environmental justice), and air quality impacts from climate change.
- Learn how to communicate scientific messages to policy-makers and lay people.
- Need research and tools to get public support (e.g., social marketing).
- Need to do life-cycle analyses on climate change policy options.
- What is the right spatial scale to implement climate change policies to avoid leakage?

New Technology

- **We need to find new and improved ways to use remaining fossil fuels and reduce CO2 (e.g., carbon sequestration and clean coal technology).**
- *Need technology demonstration projects (example of plug-in hybrid school bus demo for school district).
- *Need additional research on energy efficiency for: appliances, industrial applications, transportation corridor design, goods movement systems, and lighting (with dimmers).
- *Need additional research on battery and energy storage technology.

*(R9 could support local efforts in these areas if the opportunity arises.)

Tribal-specific Issues

- One of the greatest challenges of tribal agencies is obtaining and maintaining a place at the table regarding national climate change legislation and policy.
- GHG emissions inventories for tribal lands.
- Tribal agencies need better funding mechanisms for collaborative projects.
- Need additional funding opportunities for tribes, which can be disproportionately affected.
- How best can EPA use its statutory gap-filling and trust authority to support and/or implement tribal policies to address GHG emissions?

Tools/Resources

- **We need user-friendly modeling tools at the appropriate temporal and spatial scales for:**
  - **Climate change policy scenarios that shows impacts on air quality**
  - **CEQA applications**
  - **Impacts of climate change on air quality for SIPs**
- *Factor climate change impacts into the SIP process. (R9 could evaluate what is needed for this)
- Simplified tools for GHG emissions inventories.

- We need more funding opportunities.
- We need to better identify experts at all levels and establish a network.
- Need to include air quality component into fire management tools such as WALTER.
- More meeting opportunities, possibly via internet to save resources.
- *Need decision support tools. (R9 could help develop/distribute these)

Climate Change Policy Development

- We need regional/national efforts for consistency and to prevent leakage.
- We need to consider climate change policy jointly with air quality management.
- Need for immediate, enforceable, stringent Federal regulations
    - State and local agencies need federally-enforceable rules. Since there is no such thing as "non-attainment" for climate change, state and local agencies don't have the authority/pull with local boards.
    - Establish GHG as regulated air pollutants for the purposes of Title V.
    - *Oppose new coal-fired power plants without carbon sequestration. (R9 can provide comments when reviewing permits)
- More focus on the building/land use implications for greenhouse gases and air quality:
    - Topics include: green building, transit oriented development, and infill/smart growth
    - *Develop guidance and outreach tools targeted at County Supervisors, city/town council persons, and environmental groups for planning. (R9 can play a role)
- Need effective technology transfer to foreign countries such as India, China, and Mexico.
- Multi-media approaches and evaluation needed.
- Consider "behavior inducements" – carbon tax, high gas tax, etc. Then spend this money on infrastructure to reduce emissions.

Other Research

- We need more research on the change in meteorology such as weather patterns, inversions, mixing depth.
- We need to consider global methane increases.
- Look at changes to deposition, changes impacted by elevation, and interannual variability.
- *NOAA Initiative (R9 is participating in planning)
    - Looking at integrated climate forcing and air quality, CA prototype in 2010.
    - NOAA Plans for FY2010: intensive field campaign with aircraft and ship measurements; transformations are much better understood than emissions and deposition
- Quantification of GHG emissions is essential for any mitigation strategy.
- Work on urban heat islands and "cool surfaces."

Collaborations

- *EPA Regional offices
    - Gathering the various interested groups together.

    - Have experience in program implementation such as regulatory programs, incentive programs, public education/outreach programs, research programs, and technology demonstration programs
    - EPA R9 can play a role in bridging differences and facilitating communication between Washington DC (eg., EPA HQ) and the states/tribes.
    - Work with cities and mayors (and ICLEI)
- EPA ORD
    - Plays a critical role in providing resources and support
- EPA Headquarters
    - Collaboration with other government agencies to [instill] green business practices throughout government.
    - Work with state/local/tribal agencies to identify best practices for GHG reduction strategies.
    - Inform regional offices of activities and decisions
- Scientists
    - contribute outstanding research
- State/Local/Tribal Governments
    - Work together on regional collaboration
    - Share data/information with other agencies
- Foreign Countries
    - Climate change should have a wider regional perspective at least for the Mexican State of Baja California.
    - Consider collaboration with UK on economic modeling of climate change/air quality impacts including researchers involved in Stern Review of the economic impacts of climate change.
- Specific recommendations
    - The National Academy of Sciences hosted a 2-day meeting on Public Health Impacts of Climate Change (Presidio, Sept. 2007). The scientists felt that public health practitioners need to be well informed and start planning to get the public engaged (more trusted). Can EPA, states, and health practitioners collaborate in this effort?
    - It is difficult to adequately shape the EPA Regional role without having complete background on what is going on nationally with EPA. Can we start a dialog with other Regions on climate change programs? -especially transportation and land-use.
    - Establish long-term, funded partnerships (with third party facilitation) between agencies and science units to build capacity:
        - For policy-makers to communicate needs, and understand scientists
        - For scientists to communicate results, and understand policy-makers needs and issues.