# How Does Black Carbon Research Impact Policy Decisions?

Erika Sasser, Director
Health and Environmental Impacts Division

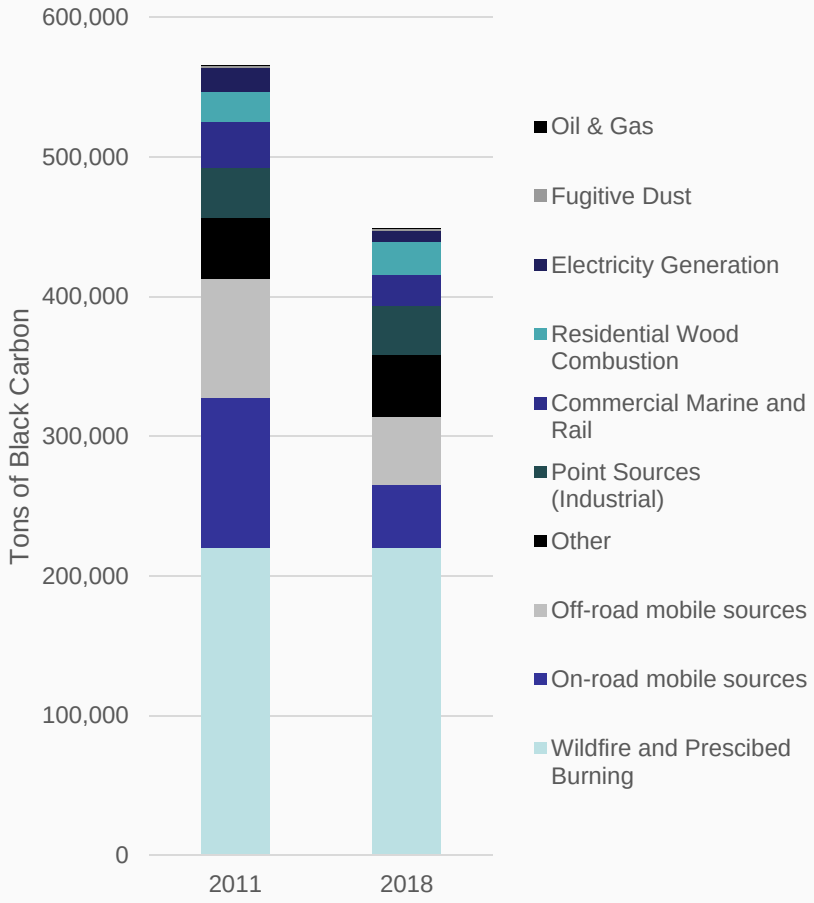
# STAR Grant Projects Address Key Research Needs

- Expanding body of knowledge about black carbon/brown carbon and impacts on human health and climate substantially advances decision-making capacity.
- Additional information on emissions, sources, and atmospheric processes will facilitate the design of policies and control strategies.
- EPA's *Report to Congress on Black Carbon* highlighted some research priorities:
  - Improved emissions inventories
  - Better understanding of black carbon atmospheric chemistry
  - Further research on black carbon climate impacts
  - Uncertainty analysis
- Already, many key gaps have been filled via completed/ongoing research efforts and STAR grants will contribute significantly to addressing these needs.
- Moving forward, improved understanding of local- and regional-scale impacts is critically important to support an increasing interest in urban air quality and climate interactions.

# Domestic Efforts to Address Black Carbon

- U.S. BC emissions have been declining and additional reductions are expected, largely through controls on mobile diesel engines.
  - Reduced from 0.64 million tons in 2005 to 0.57 million in 2011.
- Limited reductions in other sectors:
  - Stationary sources
  - Residential wood combustion
  - Open biomass burning
- Ongoing work on health effects of PM components continues.

Projected Black Carbon Emissions by Sector, 2011-2018



# International Efforts to Address Black Carbon

## Climate and Clean Air Coalition

- Formed in 2012 to raise awareness about short-lived climate pollutants (SLCPs) and their impacts and bring together different stakeholders to collectively take urgent action at a global, national and local level accelerating reduction of SLCPs, including black carbon.
- Partners include nearly 40 countries and more than 50 international organizations.

## Arctic Council

- In 2013, launched a Task Force on Black Carbon and Methane to recommend mitigation measures that should be considered by Arctic nations.
  - Significant interest in black carbon inventories.
- Mitigation to likely be a key part of U.S. chairmanship beginning in 2015.
- Short-lived Climate Forcers Project Steering Group continues to focus on funding mitigation projects.

## Global Alliance for Clean Cookstoves

- Clean cooking solutions are a promising approach to mitigating SLCPs.
  - Household air pollution also contributes to ambient air quality problems.
- Global Alliance launched in 2010 with the goal of clean cooking in 100 million homes by 2020.
- Initial commitment was up to $125 million over 5 years, including SLCP-related activities. Goal for Phase 2:  $500 million over 5 years.

# Climate and Clean Air Coalition

- Climate and Clean Air Coalition currently supports 11 initiatives, including both sector-based and cross-cutting efforts.

- Key Activities Supported by EPA/OAR/Office of Air Quality Planning & Standards

  ***Supporting National Planning for Action on SLCPs (SNAP)*** -- promotes best practices in the development of effective, integrated mitigation strategies.

  ***Assessments*** – to demonstrate the climate and air quality co-benefits of reducing SLCPs (e.g., Latin American Regional Assessment).

  ***Urban Health Initiative*** (**new**!) will work with cities to identify opportunities to reduce SLCPs to achieve air quality and health benefits.

# Benefits Assessment Tools

- EPA is developing tools to help countries quantify the benefits of alternative mitigation strategies.
- Reduced-Form Approach: Adding a **Rapid Benefits Calculator** to the Long-range Energy Alternatives Planning (LEAP) System.
  - LEAP developed by the Stockholm Environment Institute for energy policy analysis and climate change mitigation assessment.
  - Benefits Calculator is an Excel-based screening tool that enables countries to quickly quantify potential climate, health, and agriculture impacts of reducing BC and methane.
    - Incorporates GEOS-Chem Adjoint Modeling + Satellite Downscaling
- Advanced Approach: Expanding the capabilities of **BenMAP-CE**, EPA's state-of-the-art tool for evaluating health benefits of emissions reductions.
  - Open-source software which can be expanded and modified by users.
  - Requires AQ modeling and other relatively sophisticated inputs.
  - Adding new Global Burden of Disease Module to expand applicability worldwide.

# Related Project:
# Air Quality Partnerships with Megacities

- Goal: Demonstrate air quality/climate benefits of pollution reduction in the world's largest cities.
- Approach: Combine air quality management tools and international outreach efforts to promote rapid adoption and scale-up of SLCP mitigation strategies in two pilot "megacities".
- Pilot cities will be selected based on factors such as:
  - National level commitment (human and financial resources) to SLCP and air pollution mitigation
  - Presence of other related on-the-ground air quality or SLCP programs
  - A willingness to serve as a regional source for SLCP analytical and mitigation expertise
- In selecting pilot cities, the project will also leverage key partnerships:
  - U.S. Department of State's embassy monitoring program
  - World Health Organization (WHO)
  - United Nations Environment Program (UNEP)

# How Black Carbon Research Can Impact Policymaking

- Greater understanding of the climate and health effects of black carbon as a constituent of $PM_{2.5}$ can influence domestic policy by:
  - Encouraging states to chose strategies that reduce black carbon when implementing the PM National Ambient Air Quality Standards (NAAQS).
  - Accelerating expected black carbon emission reductions by promoting earlier adoption of technology for mobile and other sources.
  - Providing information on climate benefits of black carbon reductions to complement the robust literature of PM-related health effects.

- Expanding the body of knowledge on black carbon will also help promote international policies and programs to reduce SLCPs.
  - More complete information on the global impacts of local- and regional-scale impacts will support implementation of effective black carbon mitigation efforts in large urban areas.