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SAB Science Integration for Decision Making Fact Finding Interviews
EPA Office of Air and Radiation, Office of Transportation and Air Quality (OTAQ)
EPA Office of Air and Radiation, Office of Atmospheric Programs (OAP)/ Climate Change
Division (CCD)
November 19, 2009

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Schedule for November 19, 2009
SAB Science Integration for Decision Making Fact Finding Meetings

10:00 a.m. - 11:00 a.m.	Meeting with Director and Managers Office of Transportation and Air Quality
11:00 a.m. - 12:00 p.m.	Meeting with Scientific and Technical staff, Office of Transportation and Air Quality
12:00 p.m. - 1:00 p.m.	Lunch
1:00 p.m. - 2:00 p.m.	Meeting with Scientific and Technical Staff, Climate Change Division, Office of Atmospheric Programs
2:00 p.m. - 3:00 p.m.	Meeting with Director and Managers, Climate Change Division, Office of Atmospheric Programs

Logistics for Visit

SAB Members meet at 9:15 at the SAB Staff Offices to prepare for the fact-finding meetings.

The morning meetings will be held in conference rooms in Ariel Rios North (1200 Pennsylvania Avenue).

After the morning interviews, we suggest getting a quick lunch at a restaurant near the Ariel Rios Building and taking a cab to the location of the Office of Atmospheric Programs (1310 L St. NW, Washington, DC 20064) before the afternoon interviews begin.

**SAB Science Integration for Decision Making Fact-Finding Meeting
Office of Air and Radiation-Office of Transportation and Air Quality
Office Director/Managers' Meeting
Conference Room 6520**

**Ariel Rios North, 1200 Pennsylvania Avenue, NW, Washington, DC 20064
Call-in Number for SAB subgroup: 866-299-3188, access code 343-9981 and press the #
sign.
November 19, 2009, 10:00-11:00 a.m.**

Draft Agenda

Purpose of Interview: to help SAB Committee members learn about the Office of Transportation and Air Quality's current and recent experience with science integration supporting EPA decision making so that the SAB can develop advice to support and/or strengthen Agency science integration efforts.

1. Introductions facilitated by the SAB Staff Office
2. Discussion facilitated by SAB Members
3. Identification of any follow-up actions

Planned participants

EPA Office of Transportation and Air Quality

Ms. Margo Oge, Office Director, Office of Transportation and Air Quality
Ms. Sarah Dunham, Acting Director, Transportation and Climate Division; Director,
Transportation and Regional Programs Division

SAB Committee on Science Integration Committee Members

Dr. John Balbus, George Washington University
Dr. Thomas Wallsten, University of Maryland

SAB Staff Office

Dr. Vanessa Vu, Director
Dr. Angela Nugent, Designated Federal Officer

**SAB Science Integration for Decision Making Fact-Finding Meeting
Office of Air and Radiation-Office of Transportation and Air Quality
Scientific and Technical Staff
Conference Room 6524
Ariel Rios North, 1200 Pennsylvania Avenue, NW, Washington DC 20064
Call-in Number for SAB subgroup: 866-299-3188, access code 343-9981 and press the #
sign.
November 19, 2009, 11:00 a.m. - 12:00 p.m.**

Draft Agenda

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Planned participants

EPA Office of Transportation and Air Quality

Mr. Vincent Camobreco, Transportation and Climate Division

Ms. Kathryn Sargeant, Assessment and Standards Division

SAB Committee on Science Integration Committee Members

Dr. John Balbus, George Washington University

Dr. Thomas Wallsten, University of Maryland

SAB Staff Office

Dr. Vanessa Vu, Director

Dr. Angela Nugent, Designated Federal Officer

Biosketches of OTAQ Managers and Staff

Margo Tsirigotis Oge is the Director of the Office of Transportation and Air Quality. Under Ms. Oge's leadership the Environmental Protection Agency finalized three of the nation's most significant environmental accomplishments; the clean Tier 2 motor vehicle and Gasoline Sulfur Program, the historic 2007 diesel truck, buses and diesel fuel rule and the recent finalized clean off road diesel program. These programs set more than 90% reduction in harmful pollutants emitted from cars, trucks, busses, construction, farming and industrial equipment and gasoline and diesel fuel. As a result these three rules alone are estimated to prevent more than 22,000 premature deaths and hundred of a thousand of respiratory illness.

In 2004, Ms. Oge was a recipient of the Presidential Distinguished Executive Rank Award for her outstanding leadership on environmental transportation issues. She is also a previous winner of the Presidential Meritorious Award. In 2002, the Women's Council on Energy and the Environment (WCEE) honored Ms. Oge with its Woman of Achievement Award. Ms. Oge was recognized for her leadership in shepherding the Tier 2 and heavy duty diesel rules to fruition. She was the first nonpolitical appointee to receive this award.

Ms. Oge has been with the Environmental Protection Agency since 1980 and has held various management positions in the Agency. She also served as Legislative Aide to Senator John Chafee of Rhode Island, the minority ranking member of the Senate Environment and Public Works Committee supporting various programs and bills relating to environmental issues.

Prior to her current position, Ms. Oge held such positions as Director of the Office of Radiation and Indoor Air; Director of the Radon Division, Office of Radiation Programs; Deputy Division Director of the Economics and Technology Division under the Office of Toxic Substances; and Section Chief of the New Chemical Section under the Office of Toxic Substances.

Ms. Oge earned her Master's Degree in Engineering from University of Massachusetts in Lowell. She attended George Washington University and the John F. Kennedy School of Government at Harvard University. She is married, with two wonderful daughters, and resides in McLean, Virginia.

Sarah Dunham is currently the Director of U.S. EPA's Transportation and Regional Programs Division and is responsible for looking across the Office of Transportation and Air Quality's climate activities. The Division is responsible for managing the SmartWay Transport Partnership Program, interactions between Federal, State and local mobile source air quality and fuels requirements, performing technical analyses of the potential vehicle technology and fuel pathways for reducing greenhouse gas emissions in the transportation sector, the development of macroeconomic modeling tools for transportation analyses, and the maintenance of transportation greenhouse gas emission inventories. She manages a staff that includes experts in vehicle technology and renewable fuels as well as economists and policy analysts. Prior to her

current position, Ms. Dunham was the Branch Chief of the Program Development Branch in EPA's Clean Air Markets Division where she was responsible for designing the rules for and analyzing the impacts of market-based multi-pollutant reduction programs for the U.S. electricity sector. In addition to her experience in the U.S. Federal Government, Ms. Dunham worked for several years for the Illinois Environmental Protection Agency designing market-based programs to reduce air and water pollution. Ms. Dunham received a Bachelor of Science in biology from Yale University and a Master in Public Policy from Harvard University.

Vincent Camobreco. For the past three years Mr. Camobreco has worked in the U.S. EPA's Transportation and Climate Division, his main focus being on the life cycle GHG impacts of renewable and alternative fuels. Prior to that he worked on EPA's Climate Leaders program, helping develop protocols to calculate and report corporate greenhouse gas inventories to the EPA.

Mr. Camobreco's previous work experience includes over five years as an environmental consultant with Ecobalance, Inc. doing life cycle analysis for numerous industry and government clients, and several years working for an automotive parts supplier producing steering columns.

His education includes a Bachelor of Science in Mechanical Engineering from Clarkson University and a Masters of Engineering in Agricultural and Biological Engineering from Cornell University.

Kathryn Sargeant has worked for EPA's Office of Transportation and Air Quality since 1991. For the last 10 years, she has worked in the Assessment and Standards Division as the Director of the Health Effects, Benefits, and Toxics Center. Kathryn and her multidisciplinary group of scientists, engineers, economists, and policy analysts are responsible for assessing the air quality and health impacts and benefits of OTAQ's programs.

Kathryn has a B.A. in Economics and a Master's of Public Policy, both from the University of Michigan

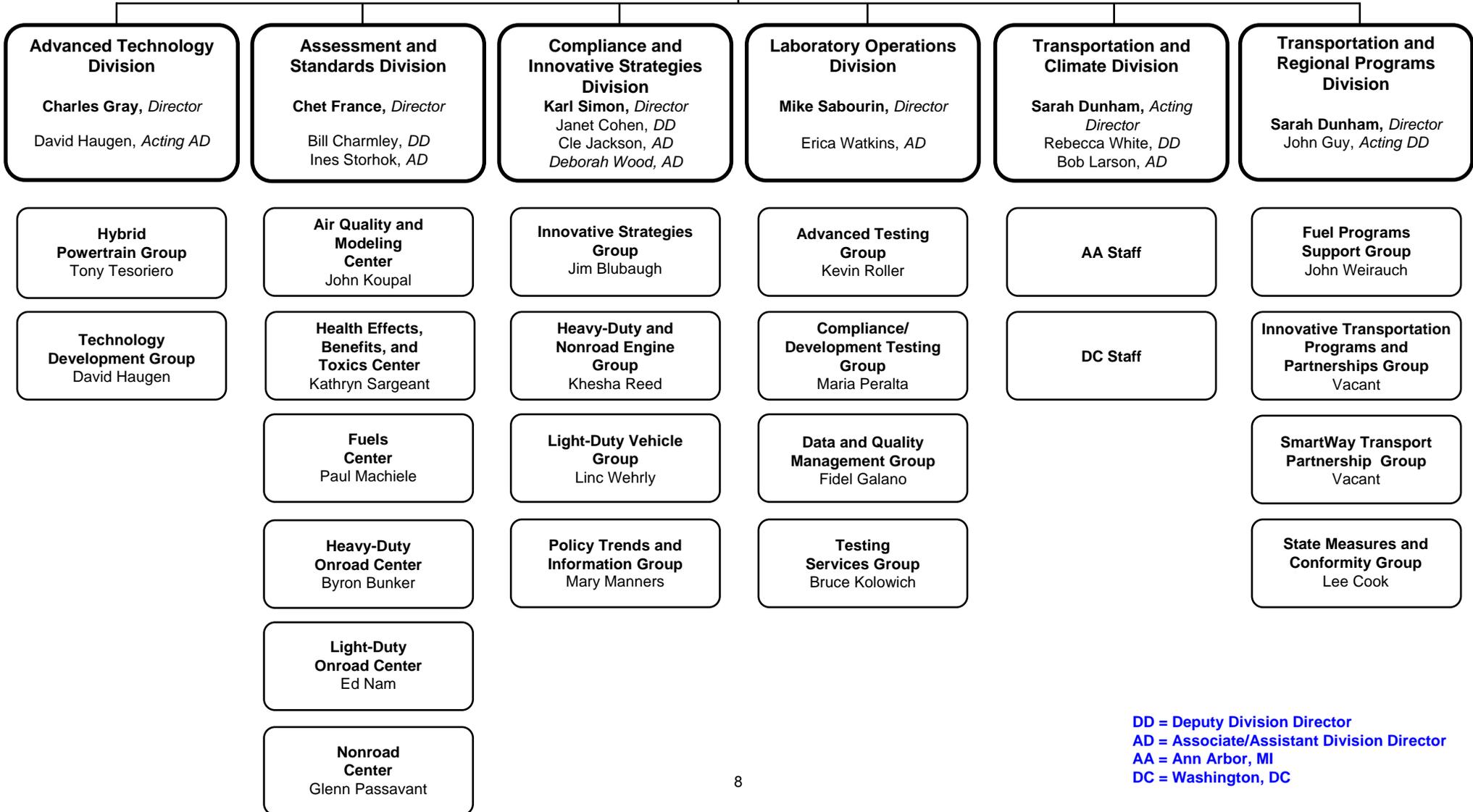


Office of Transportation and Air Quality

October 2009

Margo Tsirigotis Oge, Office Director
 Lori Stewart, Associate Office Director
 Karen Orehowsky, Chief of Staff
 Mike Haley, Planning & Budget Office

Christopher Grundler, Deputy Office Director
 Tracey Bradish, Public Information and Human Resources
 Amy Caldwell, Centralized Services Group Manager



DD = Deputy Division Director
 AD = Associate/Assistant Division Director
 AA = Ann Arbor, MI
 DC = Washington, DC

Resource Information

Office of Transportation and Air Quality

The U.S. Environmental Protection Agency's (EPA) Office of Transportation and Air Quality's (OTAQ) mission is to reconcile the transportation sector with the environment by advancing clean fuels and technology, and working to promote more liveable communities. OTAQ is responsible for carrying out laws to control air pollution from motor vehicles, engines, and their fuels. Mobile sources include: cars and light trucks, large trucks and buses, farm and construction equipment, lawn and garden equipment, marine engines, aircraft, and locomotives.

Overview

EPA's motor vehicle emissions control program was established in 1971. OTAQ is divided between EPA's headquarters in Washington, D.C., and the National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, near the headquarters of domestic automobile manufacturers.



There are about 400 employees in OTAQ. Staff expertise spans a variety of technical and public policy fields including auto mechanics, engineering, chemistry, economics, natural resources management, and law. OTAQ develops national standards for emissions, evaluates emission control technology, tests vehicles, engines, and fuels, and determines compliance with federal emission and fuel economy standards. We also develop fuel standards, inspection and maintenance programs, and market and transportation incentive programs.

Reducing Air Pollution from Mobile Sources

The early goals of OTAQ centered around working with industry to reduce emissions from individual automobiles. The approach achieved dramatic success—compared to an uncontrolled passenger car of 1970, an average car on the road today emits 60 to 90 percent less pollution over its lifetime. However, the amount of driving in this country has more than doubled since then, so transportation still accounts for a large part of national air pollution. More than half the U.S. population live in areas where pollution levels exceed federal air quality standards.



1990 Clean Air Act

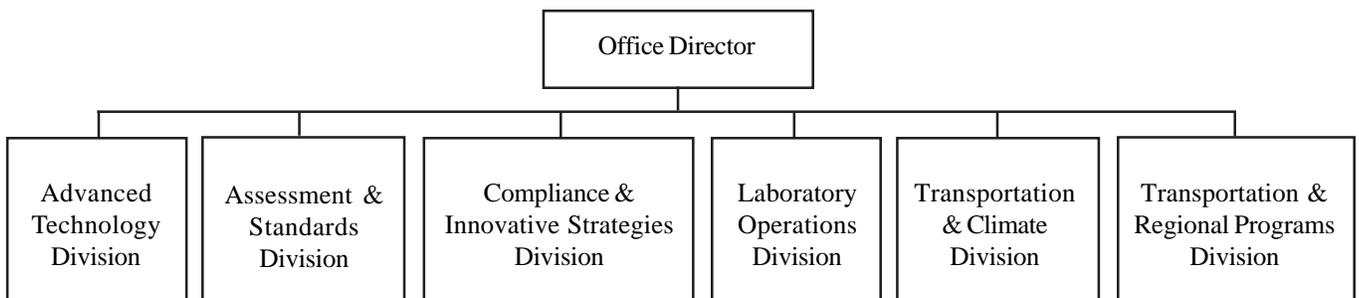
A major challenge for OTAQ is to find ways to reduce vehicle-related pollution given the increase in vehicle travel. Congress outlined a four-point strategy in the 1990 Clean Air Act Amendments to achieve further emission reductions from transportation sources. The strategy broadens our program activities beyond the original focus on new car emission standards to emphasize:



- **Clean Vehicles** - Develop more stringent emission standards for cars, buses, trucks, and nonroad engines, such as construction equipment, boats, lawn and garden equipment, and locomotives.
- **Clean Fuels** - Develop reformulated gasoline, diesel fuel, and nonpetroleum alternatives.
- **Inspection and Maintenance and Onboard Diagnostics** - Develop programs to identify faulty emission controls and ensure their repair so vehicles remain clean in actual customer use.
- **Clean Transportation Alternatives** - Develop strategies to encourage transportation alternatives to address vehicle travel growth.



Organization Overview



Divisions

Advanced Technology Division

The Advanced Technology Division (ATD) is responsible for all automotive technology development programs to improve fuel economy and to reduce vehicle and fuel emissions from mobile sources. The major focus of the division is the development of new and emerging technologies, such as Clean Car (Partnership for a New Generation of Vehicles), low NOx diesel engines, and alternative fuel technologies. ATD is also responsible for climate change policies and strategies related to vehicle efficiency and fuels.

Assessment and Standards Division

The Assessment and Standards Division (ASD) identifies and develops future emission control strategies (such as new vehicle, engine, and fuel quality standards) and national policy on mobile source emission control. The division develops regulations and policies, determines the contribution of mobile sources to pollutant emission inventories, and assesses the feasibility, cost, and in-use effectiveness of emission control technologies.

Compliance and Innovative Strategies Division

The Compliance and Innovative Strategies Division (CISD) implements emission standards for all light-duty vehicles, and highway and nonroad engines. The Division certifies that these vehicles and engines meet emission standards prior to being sold, and ensures that standards continue to be met throughout the vehicle or engine's life. CISD also promotes, under the National Clean Diesel Campaign, the voluntary use of diesel engines. These engines could continue to be operated for another 20 to 30 years and are not subject to more stringent emission standards that apply to new engines.

Laboratory Operations Division

The Laboratory Operations Division (LOD) provides emission testing services for motor vehicle, heavy-duty engine, and nonroad engine programs in support of rulemakings, enforcement actions, and test procedures development. Testing activities include certification, fuel economy in-use compliance, fuels and fuel additives analysis, and exhaust compounds analysis.

Transportation and Climate Division

The Transportation and Climate Division (TCD) is responsible for coordinating OTAQ climate programs. These responsibilities include the technical analyses of the potential vehicle technology and fuel pathways for reducing greenhouse gas emissions in the transportation sector, identifying and evaluating various options to promote the technology and fuel pathways, the development or macroeconomic modeling tools for transportation analyses, and the maintenance of transportation greenhouse gas emission inventories. TCD is also responsible for interacting with other EPA offices, external stakeholders, and the public on transportation climate issues.

**Transportation
and Regional
Programs
Division**

The Transportation and Regional Programs Division (TRPD) works with regions, states, local governments, and other stakeholders to reduce pollution from fuel, transportation, and nonroad sources. TRPD implements national and regional pollution control programs, such as the reformulated gasoline (RFG) and inspection and maintenance (I/M) programs. This division develops and supports voluntary initiatives, such as the Best Workplaces for Commuters,^(SM) that encourage clean air and liveable communities. TRPD also implements a transportation-based climate change program.

For More Information

You can access information on OTAQ programs and regulations from our Web site at:

www.epa.gov/otaq

You can also contact the NVFEL library for document information at:

U. S. Environmental Protection Agency
Office of Transportation and Air Quality
NVFEL Library
2000 Traverwood Drive
Ann Arbor, MI 48105
(734) 214-4311



EPA Mobile Source Priorities

Recent Mobile Source Clean Air Rules: *Comprehensively Addressing Air Pollutants*

- **Clean Cars and Passenger Trucks**
 - Gasoline sulfur control (30 ppm avg / 80 ppm max, 2006 for most refiners)
 - 77-95% lower light-duty vehicle standards (phased in from 2004-2009)
 - Same standards for light trucks and cars; gasoline and diesel

- **Clean Heavy-Duty Trucks and Buses**
 - Diesel sulfur control (15 ppm maximum, phased in from 2006-2010)
 - 90% lower heavy-duty gasoline & diesel vehicle standards
 - PM filter forcing standards, NOx catalyst based standards

- **Clean Nonroad Diesel Engines and Equipment**
 - Diesel sulfur control (2 steps - 500 ppm in 2007, 15 ppm in 2010)
 - Marine diesel sulfur control (15 ppm maximum) in 2012
 - 90-95% lower emission standards – 2011-2014

- **Locomotive and Marine Diesel Standards**
 - Requiring same technologies as on-highway and nonroad, 2014-2016
 - Reduces PM by 90% and NOx by 80 percent for newly-built locomotives and marine diesel engines

- **Small Engine Standards**
 - New exhaust emission standards take effect in 2011 or 2012 depending on engine size



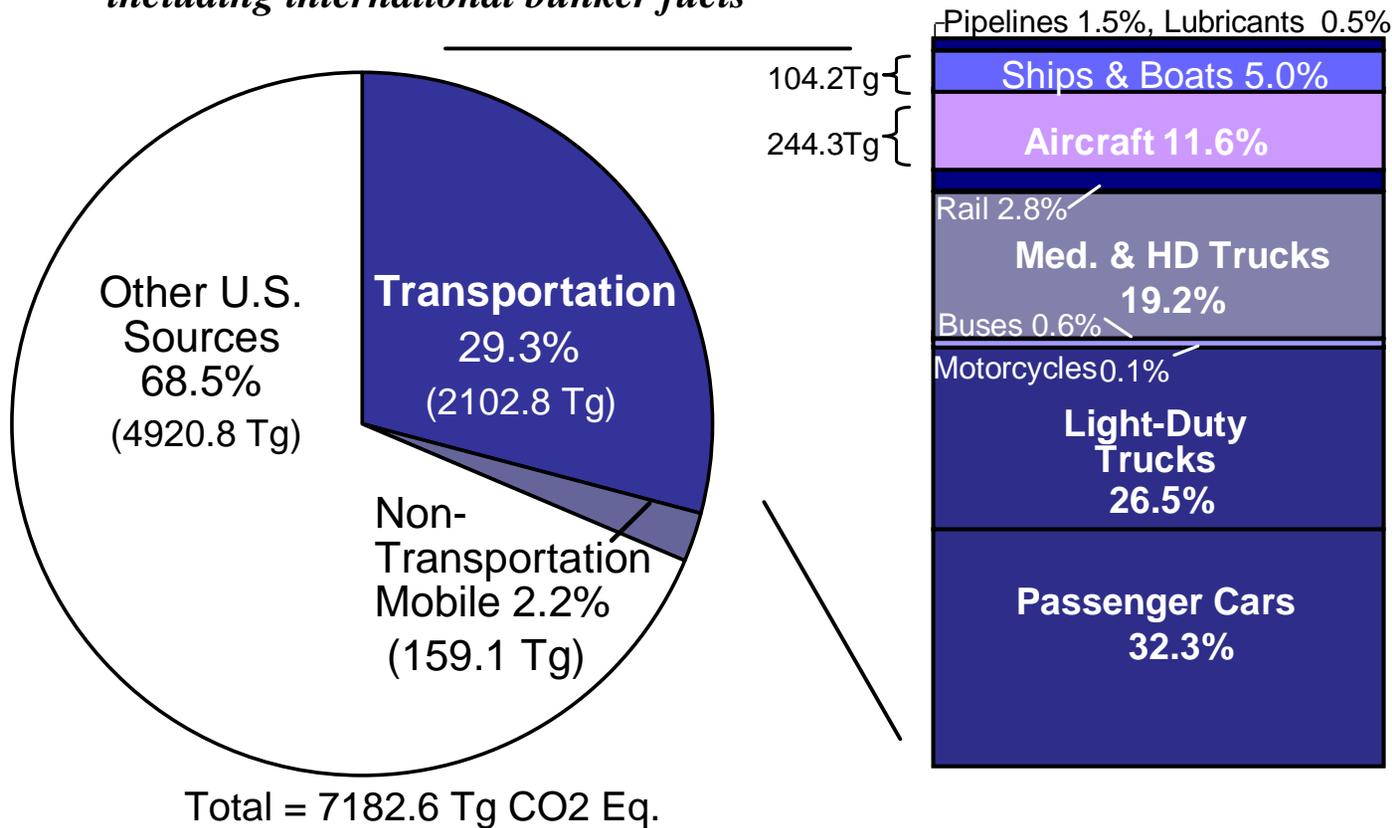


Addressing Ocean-Going Vessels is also a High Priority

- By 2030 Ocean Going Vessels (OGVs) will contribute about 34% of NO_x and 45% of PM emissions from mobile sources
 - Over 40 major ports are located in PM and NO_x nonattainment areas.
- EPA drafted stringent new standards that were adopted by the International Maritime Organization (IMO) in October 2008, after several years of effort
 - New engines - 80% NO_x reduction by 2016
 - Existing engines – 15-20% NO_x reductions starting in 2010
 - Fuel Quality Standards - 97% fuel sulfur reduction by 2015
- On March 27, 2009, EPA submitted a joint U.S./Canada proposal for an Emission Control Areas designation.
 - Approved in July, 2009 IMO meeting – Final Adoption by March, 2010
- Also proposing rule under the CAA to implement new OGV standards.
- By 2030, the emission reductions associated with these combined efforts will annually prevent:
 - Between 13,000 and 32,000 PM-related, and 220 to 980 ozone-related premature deaths

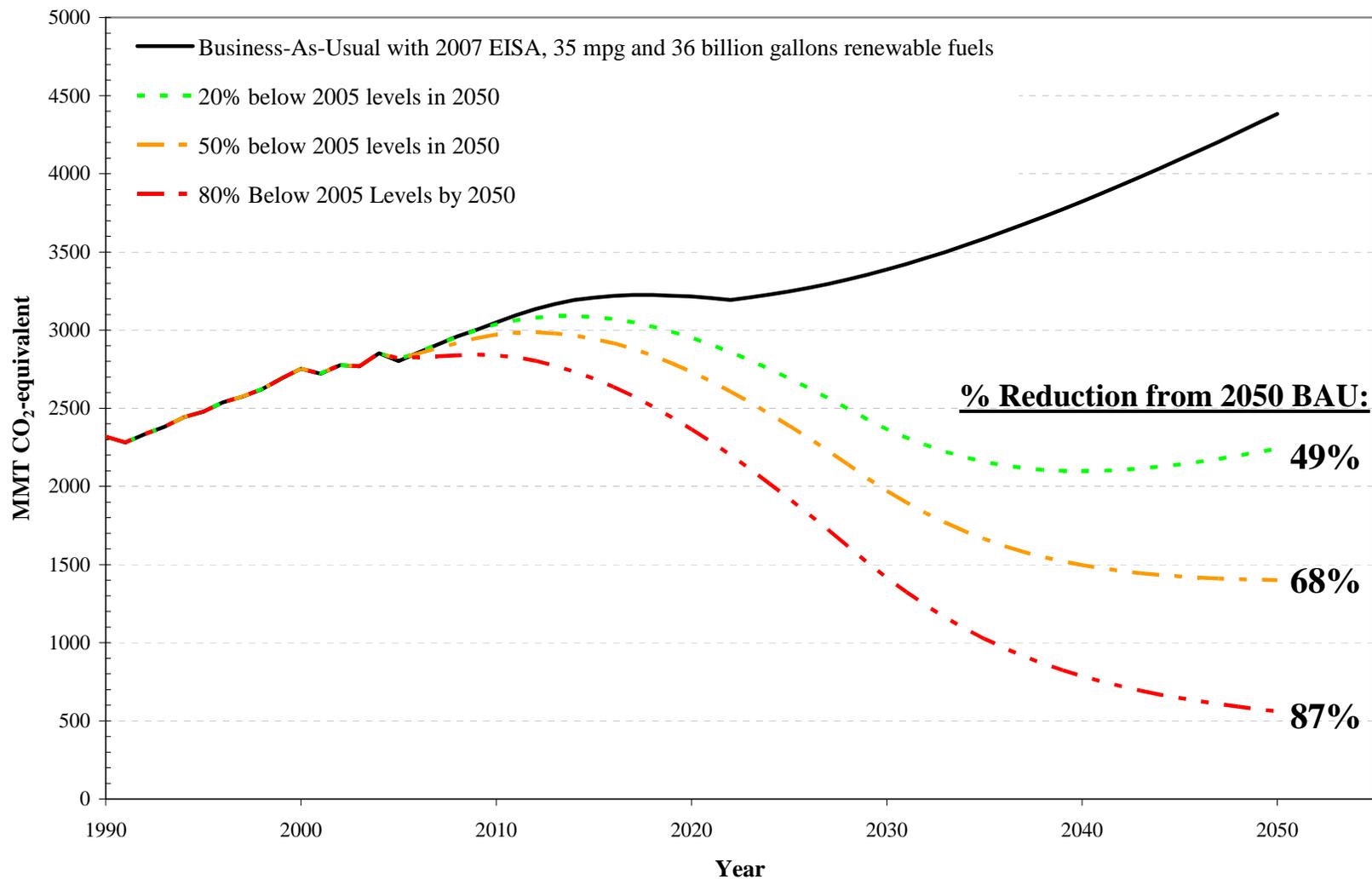
Mobile Sources Represent a Large and Growing Share of the Nation's GHGs

2006 U.S. GHG Emissions
including international bunker fuels



Transportation is the fastest-growing source of GHGs in the U.S., accounting for 47 percent of the net increase in total U.S. emissions from 1990-2006.

U.S. Transportation Sector GHG Emissions



(Includes all IPCC categories + nonroad + upstream fuel GHG emissions)



Recent History ...

- April 2007: In *Massachusetts vs EPA*, Supreme Court rules EPA improperly denied ICTA's petition
 - GHGs are air pollutants under CAA and EPA must decide whether to regulate using permissible criteria
 - 202(a) covers all on-highway vehicles including heavy-duty trucks
- October 2007 to January 2008 - EPA received 7 additional petitions requesting EPA to propose and adopt GHG standards for aircraft, OGVs, and nonroad engines and equipment.
- July, 2008: Advanced Notice of Proposed Rulemaking on GHGs
- April 2009: Proposed finding that greenhouse gas emissions endanger public health and welfare
 - Also proposed that motor vehicles cause or contribute to global climate change
- May 2009: President Obama announced first-ever federal emissions standards for GHGs
- June 2009: Granted California GHG Vehicle Waiver



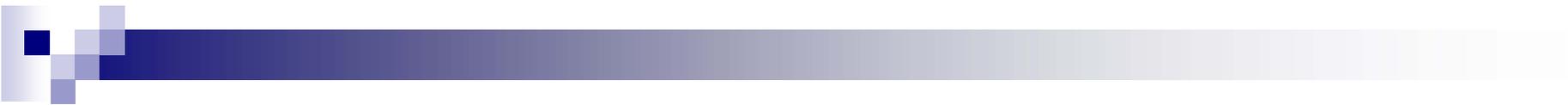
Current Climate Priorities

- Vehicle GHG Rule – Joint proposal with DOT CAFÉ
- Heavy Duty GHG standards
- Petitions on Nonroad GHG standards – marine, aviation, and other non-road engines
- Existing Fleet and Reducing Demand
- Renewable Fuel Standard



Vehicle GHG Standards

- May 19 - President Obama announced a national policy to reduce greenhouse gases and improve fuel economy from new cars and trucks
- EPA and DOT signed a “Notice of Upcoming Joint Rulemaking to Establish Vehicle GHG Emissions and CAFE Standards”
 - EPA will propose first federal GHG emission standards under Clean Air Act
 - NHTSA will propose CAFE standards under Energy Policy and Conservation Act
- Will allow auto manufacturers to produce a single vehicle fleet that meets both federal and California standards
- GHG standards will result in CO₂ reduction of over 900 mmt, and oil savings of about 1.8 billion barrels



Key Elements of Vehicle GHG Standards

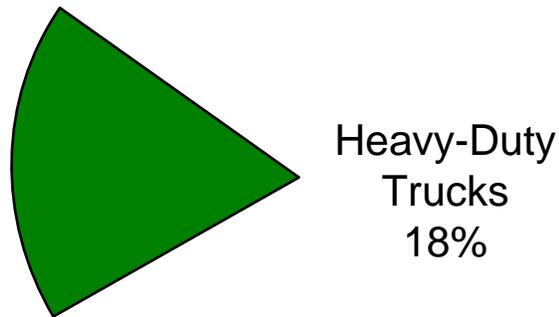
- Fleetwide average standard of 250 grams/mile of CO₂ in model year (MY) 2016
 - Standards phased-in beginning in model year 2012
 - National GHG standard equivalent to California standards
- The 250 gram/mile CO₂ standard corresponds to 35.5 mpg
- Fleetwide CO₂ standard may be met partially through credits from improved air conditioner operation
 - Air conditioning (A/C) related emissions include both indirect CO₂ from increased load on engine, and direct HFC refrigerant leakage



Key Elements of Vehicle GHG Standards

- Footprint based attribute with separate car and truck standards
- Flexibilities
 - Use of air conditioning credits under the EPA program
 - Flexible fueled vehicle credits
 - Early credit opportunities and incentives for advanced technologies
 - Temporary Lead-time Allowance Alternative Standard Program under the EPA program
 - Unlimited trading between a single firms car and truck fleets
- Compliance
 - Minimize duplication between EPA and DOT
 - EPA and DOT use same basic data
- Timing
 - Proposal: August 2009
 - Final Rule: March 2010

Heavy-Duty Sector GHG Emissions

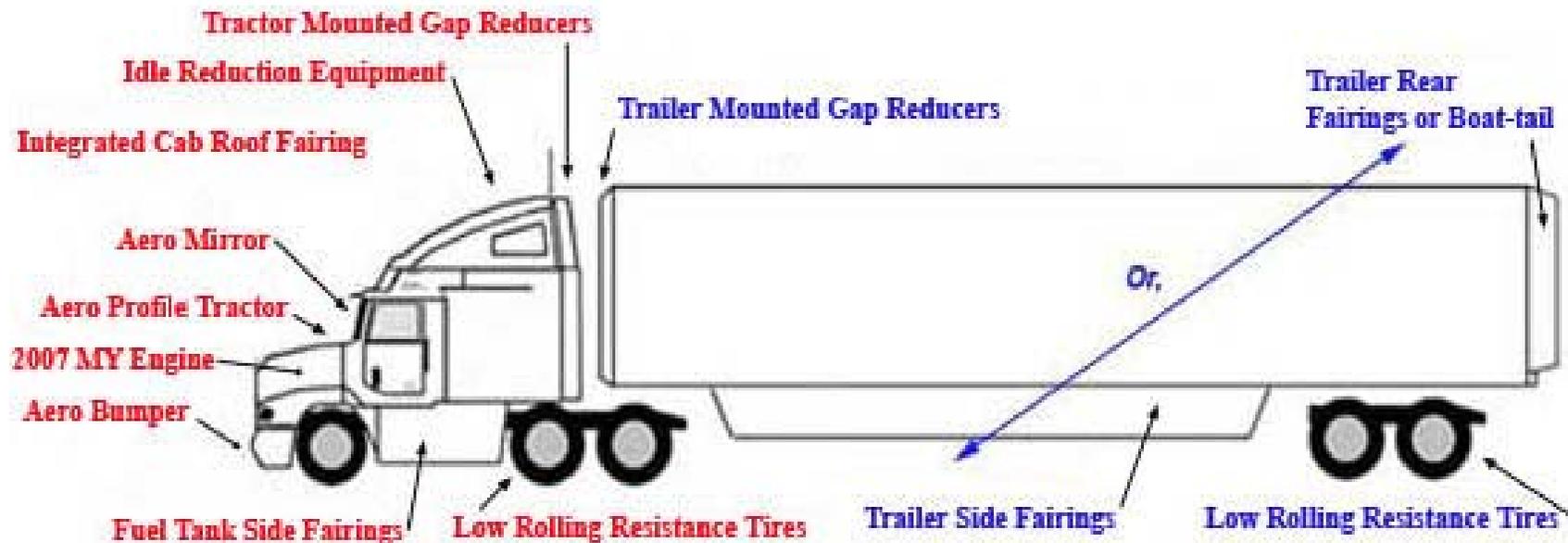


- CO2 emissions expected to grow 29% between 2006 and 2030
- Diesel-powered trucks constitute 91% of the sector's GHG emissions
- Combination trucks "18-wheelers" emit 75% of the sector's GHG emissions

SmartWay Certified Tractor and Trailer

Tractor Strategies
~12% Reduction

Trailer Strategies
~11% Reduction





Goals of a HD GHG Regulatory Program

- Reduce GHG emissions through the introduction of GHG-efficient truck technology
- Encourage technology innovation and early introduction
- Build upon the successful SmartWay Program
- Maximize flexibility to truck buyer
- Means to ensure real world performance matches regulatory expectations (compliance program)
- Provide useful information to consumers

Advancing Best Practices in the Existing Fleet through SmartWay

- SmartWay Transport Partnership program works with the freight industry to adopt sustainable transportation strategies that save fuel, reduce emissions, and protect the environment.
- Launched in 2004, SmartWay currently has over 1500 partners
 - On track to reduce over 7 MMTCO₂ and save the trucking industry over \$1.8 billion in fuel costs (620 million gallons) each year by 2011
- Program promotes cost-effective strategies
 - idle control, enhanced aerodynamics, PM/NO_x after treatment devices, improved logistics, hybrids
- Innovative financing for truck upgrades
 - \$30 M in innovative financing grants in 2009 AARA funding (of total \$300 M)
- Also promote fuel efficient, SmartWay certified vehicles through Green Vehicle Guide



Renewable Fuel Standard *Overview*

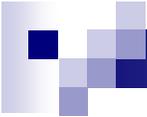
- RFS in Energy Independence & Security Act of 2007
 - NPRM completed, May 2009
 - Final Rule, December, 2009

- Modified first RFS program from Energy Policy Act of 2005
 - Volumes increase to 36 B gal/yr by 2022
 - Compared to 7.5 B gallons by 2012 under EPACT

 - Establishes new renewable fuel categories with GHG thresholds
 - No threshold for ethanol up to 15 B gallons, 20% for new production
 - 50% GHG reduction for advanced biofuels, including biomass diesel
 - 60% GHG reduction for cellulosic biofuel (16 B gallons)

 - EISA language permits EPA to adjust the lifecycle GHG thresholds by as much as 10%

 - Provides new waiver provisions if volumes can't be met

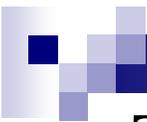


Renewable Fuel Standard *Key Issues*

- The proposed rulemaking includes the first ever GHG lifecycle analysis, including both direct and indirect impacts.
 - EISA legislation required including significant direct and indirect impacts including land use impacts
 - EPA developed a technically sound methodology that greatly advanced state-of-the-art of lifecycle assessment
 - Input from USDA, DOE academics, researchers and other stakeholders
 - Proposal recognizes uncertainty in assessments and very transparent in presenting issues, options and seeking comment
 - Conducted public workshops and additional peer review of methodology

- Ethanol “blend wall” will occur when the market is saturated with E10. Estimates vary from 2010-2013.
 - Only E10 and E85 mixtures are approved for use in vehicles.
 - Other blends would require a waiver based on extensive vehicle testing.
 - Growth Energy requested a waiver to increase allowable ethanol content of gasoline to 15 percent.

- Cropland definition and implementation – to protect sensitive lands.



The American Clean Energy and Security Act (ACES) Recognizes the Need for Transportation Measures

Heavy-duty Vehicles and Engines

- Under CAA Sec. 202, standards issued by end of 2010, but rules would apply no sooner than 3 model years or 4 years after regulations are finalized

Nonroad Vehicles and Engines

- Under CAA Sec. 213, standards issued by end of 2012 for classes/categories that both contribute significantly to total emissions of GHGs from nonroad engines and vehicles and provide the greatest potential for reductions

Expanded SmartWay Program

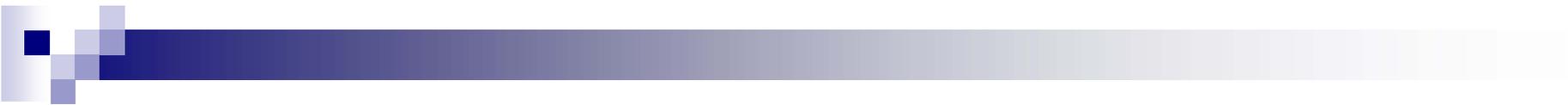
- EPA financing program for the adoption of low-GHG strategies
- EPA to establish measurement protocols and verification criteria for low-GHG technologies and strategies

Transportation Efficiency - State & Local Programs

- States/large MPOs must establish GHG reduction targets
- EPA to establish national-level targets and regulations on methods for MPO targets

Black carbon

- Research report due to Congress within one year
- Within 18 months, propose regulations under existing CAA authorities to reduce BC emissions, OR a finding that existing regulations adequate



In Conclusion...

- Air quality measures are still an important part of our portfolio – several new standards are still in the pipeline.
- Transportation measures are essential to reduce GHGs, even under a cap and trade scenario – due to weak price signal
- We are now moving forward on vehicle GHG standards under the CAA to implement the President's May 19 announcement, and finalizing the RFS standard, under EISA.
- Also need to address heavy-duty GHGs and respond to petitions to address nonroad engines.
- House climate legislation recognized the need for transportation measures.

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Scientific and Technical Staff
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Planned participants

EPA Climate Change Division

Mr. Jason Samenow, Climate Science Analyst

Mr. Benjamin Deangelo, Senior Analyst for Climate Change Policy and Science

SAB Committee on Science Integration Committee Members

Dr. John Balbus, George Washington University

Dr. Thomas Wallsten, University of Maryland

SAB Staff Office

Dr. Angela Nugent, Designated Federal Officer

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Planned participants

EPA Climate Change Division

Ms. Dina Kruger, Director, Climate Change Division
Ms. Rona Birnbaum, Chief, Climate Science and Impacts Branch, Climate Change Division

SAB Committee on Science Integration Committee Members

Dr. John Balbus, George Washington University
Dr. Thomas Wallsten, University of Maryland

SAB Staff Office

Dr. Angela Nugent, Designated Federal Officer

Biosketches of CCD Managers and Scientific Staff

Rona Birnbaum manages the Climate Science and Impacts Branch in EPA's Climate Change Division. She has been with the EPA for about 20 years working on a number of different air-related science and policy issues. The Branch works to synthesize and leverage emerging science and works closely with researchers and economists to assess implications of climate change impacts, mitigation approaches and adaptation strategies in the U.S. Rona works closely with other federal agencies and stakeholders as an interface with EPA's program office efforts on climate change impacts, evolving mitigation technologies and adaptation efforts.

Dina Kruger is Director of the Climate Change Division at the U.S. Environmental Protection Agency. Ms. Kruger is responsible for a wide range of programs and analyses dealing with climate change policy, economics, mitigation technologies, science and impacts, and communication. She is currently managing EPA's economic analyses of proposed Congressional climate legislation, implementation of a recent EPA rulemaking on the mandatory reporting of greenhouse gases, and the assessment of climate science and impacts for Clean Air Act regulatory action. Ms. Kruger directs the EPA's domestic partnership programs on methane and fluorinated gases and the Methane to Markets Partnership, an international initiative aimed at the development of cost-effective methane recovery and use projects and involving developed and developing countries as well as the private sector. She also manages preparation of the US National Inventory of Greenhouse Gases and Sinks, which is submitted annually to the UN Framework Convention on Climate Change, and served as an elected member of the Intergovernmental Panel on Climate Change's Task Force Bureau on Greenhouse Gas Inventories from 1998 to 2008.

Ms. Kruger joined EPA in 1989, and prior to that worked at ICF Consulting, the Investor Responsibility Research Center, and the Office of Technology Assessment. She holds a Bachelor of Arts degree from the University of Washington, and received a Master's degree from the Energy and Resources Group at the University of California, Berkeley.



Jason P. Samenow
Climate Science Analyst
 U.S. EPA, 1200 Pennsylvania Ave. (6207J), Washington, DC 20460
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Jason Samenow has worked as a Climate Change Analyst at the U.S. EPA for the past eight years. In that capacity, he has played a leading role in tracking and assessing climate change science developments and communicating the salient information to policymakers and the general public. Most recently, he has served as an author and technical expert for EPA's Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. He is also working on analytical projects pertaining to climate change indicators, stabilization scenarios, and the impacts of future warming on heat health effects. In addition, he serves as a co-chair for the U.S. Global Change Research Program Communications Interagency Working Group.

Previously, he was the project manager responsible for the development of EPA's Climate Change Web site launched in late October 2006 <<http://www.epa.gov/climatechange>> and drafted the entire section on science as well as pages on extreme events and regional climate impacts, working with scientists across the Federal government. In addition, Jason led production of the Excessive Heat Events Guidebook <<http://www.epa.gov/heatisland/about/heatguidebook.html>> -- an interagency report (EPA, NOAA, CDC and FEMA) published in June 2006, offering detailed information about the climatology of excessive heat events, the risk factors, and options for responding to them.

Jason earned his undergraduate degree in Environmental Science (concentration: Atmospheric Science) from the University of Virginia in 1998 and an MS in Atmospheric Science from the University of Wisconsin-Madison in 2000. He is a past Chair of the DC Chapter of the American Meteorological Society, a Weather and Society Integrated Studies Fellow <<http://www.sip.ucar.edu/wasis/>>, an alumnus of the American Meteorological Society's Policy Colloquium, and Chief Meteorologist of the Capital Weather Gang blog on washingtonpost.com -- which offers original, interactive Washington, DC weather commentary.

Benjamin DeAngelo

Mr. DeAngelo is currently a senior analyst for climate change policy and science in the Climate Change Division of the U.S. EPA's Office of Air and Radiation in Washington, DC. Recently DeAngelo has been serving as the technical lead for EPA's decisions regarding an endangerment finding for greenhouse gases under the Clean Air Act. More generally, Mr. DeAngelo works to improve EPA's capabilities to estimate and communicate climate change impacts for policy analyses, by working among the policy, economic, and physical science communities. Mr. DeAngelo is also taking a lead technical role for how EPA addresses the question of dealing with black carbon emissions as a climate policy matter. DeAngelo has recently been nominated to serve as the U.S. co-chair of a task force on short-lived climate forcers under the Arctic Council. Mr. DeAngelo received his bachelor's from Penn State University and master's in the Department of Geography at the University of Toronto.

Introduction to the Office of Atmospheric Programs

Brian McLean Director			
<u>Clean Air Markets Division</u>	<u>Stratospheric Protection Division</u>	<u>Climate Change Division</u>	<u>Climate Protection Partnership Division</u>
Sam Napolitano Director	Drusilla Hufford Director	Dina Kruger Director	Kathleen Hogan Director

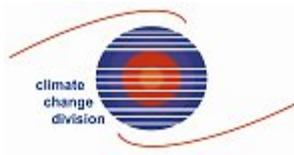
Over the past decade, OAP has become a world leader for its work on market based programs such as the Acid Rain Program and public/private partnership programs such as ENERGY STAR. Our programs to protect the ozone layer, address climate change, and improve regional air quality have resulted in billions of dollars in health benefits annually, and thousands of lives saved.



EPA's **Clean Air Markets Division (CAMD)** includes several market-based regulatory programs designed to improve air quality and ecosystems. The most well-known of these programs are EPA's Acid Rain Program and the NOx Programs, which reduces emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) compounds that adversely affect air quality, the environment, and public health. CAMD also plays an integral role in the development and implementation of the Clean Air Interstate Rule (CAIR) and the Clean Air Mercury Rule (CAMR).



EPA's **Stratospheric Protection Division (SPD)** protects human health and the environment by restoring the earth's protective ozone layer. SPD implements the requirements of Title VI of the Clean Air Act, which is the legal framework for U.S. compliance with the Montreal Protocol on Substances that Deplete the Ozone Layer. SPD also promotes advanced technologies and the responsible use of non-ozone depleting chemicals to minimize impacts on human health while we work to restore the ozone layer, and SPD also educates Americans to be SunWise by avoiding overexposure to solar ultraviolet radiation.



EPA's **Climate Change Division (CCD)** is the EPA lead on domestic and international climate change policy. CCD pursues programs to further the Administration's broader climate policy and objectives. Some of the division's main functions include: compiling and reporting the U.S. greenhouse gas inventory under the United Nations Framework Convention on Climate Change (UNFCCC); managing several non-CO₂ voluntary programs such as the Landfill Methane Outreach Program, and the international Methane to Markets Partnership; tracking emerging issues in climate science, impacts, economics and innovative technologies; and supporting U.S. bilateral and multilateral partnerships. Please visit our updated Climate Change web site.



EPA's **Climate Protection Partnership Division (CPPD)** promotes greater use of energy efficient products and practices in the residential, commercial and industrial sectors through the ENERGY STAR partnership program. The Division's programs such as Climate Leaders provide information, technical assistance, and recognition for environmental leadership to organizations as they develop strategies and take advantage of proven opportunities to reduce their GHG emissions. CPPD also encourages investments in efficient, clean technologies such as combined heat and power (CHP) and green power from renewable resources.

Climate Change Division Organization and Current Key Activities

The Climate Change Division is comprised of four branches, focusing on climate science and impacts, climate economics, non-CO2 programs, and program integration (handling activities requiring cross-office information such as GHG emissions inventories and the Mandatory GHG Reporting Rule). Below is a list of current key activities of the Division:

Climate Regulatory Development

- **Mandatory GHG Reporting Rule**
The Climate Change Division is responsible for the development and implementation of the Mandatory Reporting of Greenhouse Gases Rule, which was finalized September 22, 2009. The rule requires reporting of greenhouse gas (GHG) emissions from all sectors of the economy in the United States, covering 31 unique source categories comprised of large industries as well as suppliers of fossil fuels. The purpose of the rule is to collect accurate and timely data on GHG emissions that can be used to inform future policy decisions. More information about the Mandatory GHG Reporting Rule can be found at <http://epa.gov/climatechange/emissions/ghgrulemaking.html>.
- **Endangerment Findings under the CAA**
CCD is leading the development of the technical support documents underlying endangerment findings for GHGs under the Clean Air Act. EPA released proposed endangerment and cause or contribute findings under section 202 (a) of the CAA on April 17, 2009. The April proposal found that greenhouse gases in the atmosphere endanger the public health and welfare of current and future generations. EPA has received over 380,000 public comments and CCD staff have reviewed and are responding to significant comments in the development of the final rule. The findings were submitted to OMB for final inter-agency review on November 6, 2009. More information about the Endangerment Findings can be found at <http://epa.gov/climatechange/endangerment.html>.
- **Economic and Policy Analyses for Climate Legislation/GHG Regulation under CAA**
CCD provides analytical and technical support for the development of policy options for GHG regulation under the Clean Air Act, and for climate-related legislation. In addition, at the request of members of Congress, CCD's Climate Economics Branch has led numerous economic analyses for various climate bills. More information about EPA's economic analyses of climate bills can be found at <http://epa.gov/climatechange/economics/economicanalyses.html>.
- **Geologic Sequestration**
OAR (CCD) is working closely with the Office of Water in the development of a rule for Federal requirements under the Underground Injection Control (UIC) Program for CO2 geologic sequestration wells. CCD also provides technical and

policy analysis as EPA considers other potential rulemakings surrounding geo-sequestration of carbon dioxide.

Annual Inventory of U.S. GHG Emissions and Sinks

CCD leads the development of the Annual Inventory of U.S. Greenhouse Gas Emissions or Sinks, which tracks the national trend in GHG emissions and removals since 1990. This inventory is submitted to the United Nations annually in accordance with the Framework Convention on Climate Change. More information on the inventory can be found at: <http://epa.gov/climatechange/emissions/usgginventory.html>

Climate Impacts and Adaptation

CCD's Climate Science and Impacts Branch leverages climate science in order to support policy, impacts and benefits analysis related to climate change and mitigation activities. Key activities (in addition to technical support for the endangerment proposal, listed above) include:

- **Science Assessments and Impact Analyses** – CSIB participates in the development of U.S. Global Change Research Program's (USGCRP), formerly Climate Change Science Program (CCSP) Synthesis and Assessment Products (SAP), as well as products by the Intergovernmental Panel on Climate Change. CSIB led the development of the USGCRP SAP 4.1, "Coastal Sensitivity to Sea-level Rise: A Focus on the Mid-Atlantic Region," released January 2009. In general, CSIB leverages existing science for application in policy benefits analysis.
- **Climate Communication** – CSIB synthesizes climate science and impacts for the public through the EPA's climate change web site as well as development of materials for the public.
- **Climate Ready Estuaries Program** – CSIB works in partnership with the Office of Water and the National Estuary Programs to assess climate change vulnerabilities, develop and implement adaptation strategies, engage and educate stakeholders, and share lessons learned.

Non-CO₂ Partnership Programs

CCD's Non-CO₂ Programs Branch manages a number of voluntary programs for the reduction of methane and high global warming potential (High GWP) gases from energy and industrial sources. The domestic methane programs, consisting of the AgSTAR, Coalbed Methane, Gas STAR, and Landfill Methane programs, advance cost-effective, near-term methane recovery and use as a clean energy source. CCD supports the Methane to Markets Partnership (M2M), an international initiative for cost-effective methane recovery and use, comprised of 31 partner governments and a large project network of private sector and non-governmental organizations. CCD also manages partnership programs in the electric power, aluminum, magnesium, and semiconductor sectors, for the reduction of high GWP gases, including perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF₆).