



# **Climate Change, Stratospheric Ozone, and the Clean Air Act**

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Overview of the Clean Air Act

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# Climate Change and the Clean Air Act





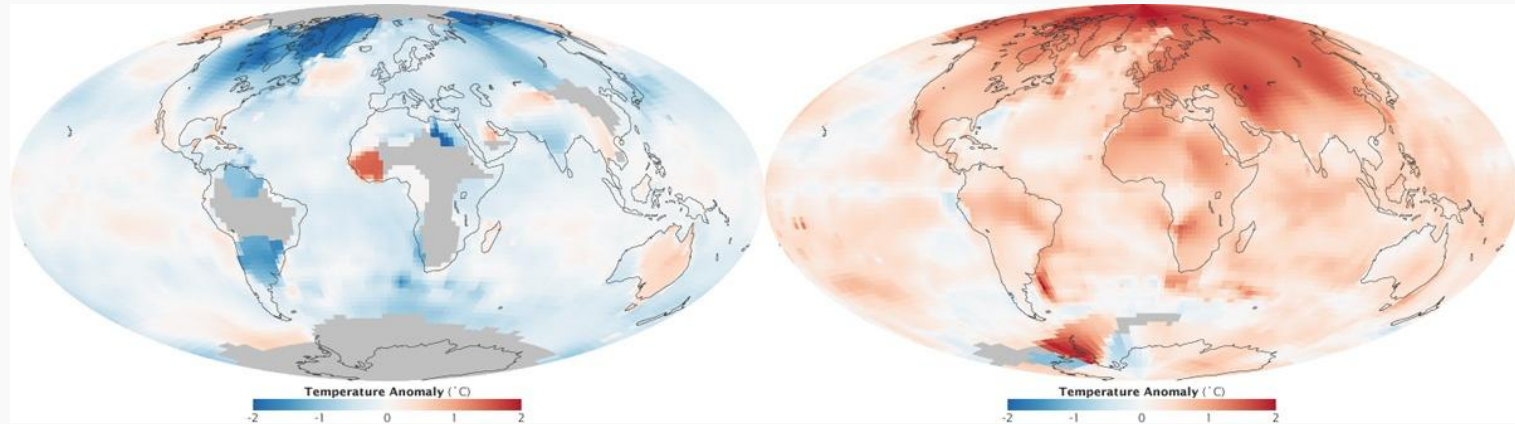
# Climate Science Overview

Human activities, like driving, manufacturing processes, and the clearing of forests contribute to greenhouse gas emissions and warm the Earth.



# Natural causes alone cannot account for all of the changes in recent decades

Our emissions of heat-trapping greenhouse gases are the primary cause of the Earth's recent warming.

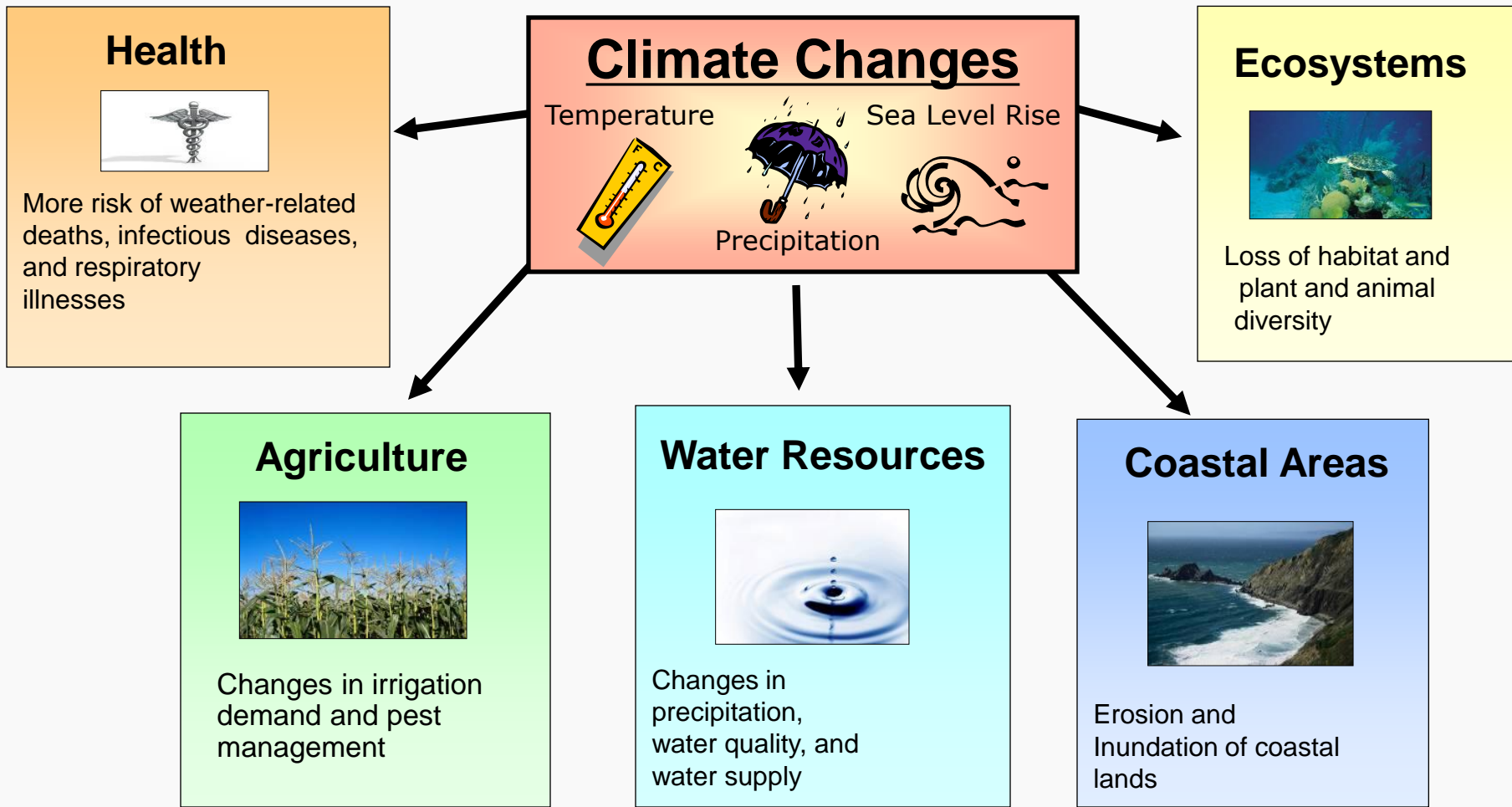


**Temperatures in the  
1880's**

**Temperatures in the  
2000's**



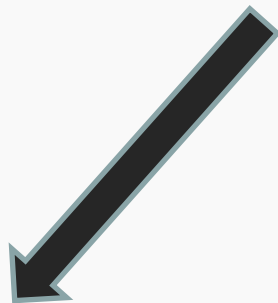
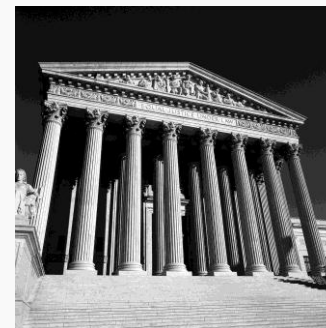
# Climate changes are underway in the United States and are projected to grow





# EPA Taking Action on Greenhouse Gas (GHG) Emissions

U.S. Supreme Court Decision



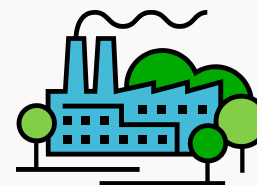
GHG  
Endangerment  
Finding



First GHG  
Standards for  
Passenger  
Vehicles



Clean Air Act  
Process for  
Stationary  
Sources





# Supreme Court Decision




## *Massachusetts v. EPA* (April 2007)

- Ruled that GHGs, including carbon dioxide, are “air pollutants” under the CAA
- Required EPA to determine whether or not GHGs can be reasonably anticipated to endanger public health or welfare, or if it is scientifically impossible to determine
- Required EPA to determine whether or not emissions of GHGs from new motor vehicles cause or contribute to GHG air pollution
- Required EPA to respond to petition for rulemaking requesting EPA regulate carbon dioxide and other GHG from motor vehicles



# Endangerment Finding

- On December 7, 2009, EPA found that greenhouse gas emissions endanger public health and welfare
- Scientific Basis of the Endangerment Finding
  - Comprehensive and transparent review
  - Science comes from many highly respected, peer reviewed sources
-  The Conclusion: there is compelling scientific evidence of climate change and that greenhouse gases endanger the health and welfare of the American people.
  - New motor vehicles and new motor vehicle engines also found to contribute to GHG pollution



# Administrator's Guiding Principles for Taking Action on GHG Emissions

- Common Sense
- Cost-Effectiveness
- Clarity, Achievability and Flexibility
- Transparency
- Focus on the largest emitters





# First GHG Standards for Passenger Vehicles

- Issued April 2010 by U.S. EPA/U.S. DOT
- Cooperative process designed to increase fuel efficiency, reduce emissions, lower consumers fuel costs, and conserve oil.





# First GHG Standards for Heavy- and Medium-Duty Trucks

- Issued August 9, 2011 by U.S. EPA and DOT
- New standards projected to reduce GHG emissions and oil use, improve efficiency, save truck operators money, and reduce other pollutants.





# GHG Emissions from Stationary Sources

When light-duty vehicle standards went into effect in January 2011, EPA was also required to address GHG emissions from stationary sources

## Key Actions:

- **May 2010:** Tailoring Rule
  - Focuses permitting requirements on the largest emitters
- **Dec 2010:** Series of rules to create a regulatory framework for GHG permitting
- **Dec 2010:** Proposed schedule for setting GHG emissions standards for fossil fuel fired power plants and petroleum refineries





# Greenhouse Gas Reporting Program

**Goal:** To provide a better understanding of where U.S. GHG emissions are coming from

- Directed by Congress in 2008 Appropriations Act
- Applies to facilities emitting large quantities of GHGs
- Covers an estimated 85 percent of total U.S. GHG emissions
- Data collection began in January 2010
- First annual reports due in late summer 2011
- Public release by the end of 2011 of data that is not confidential business information





# Renewable Fuel Standard

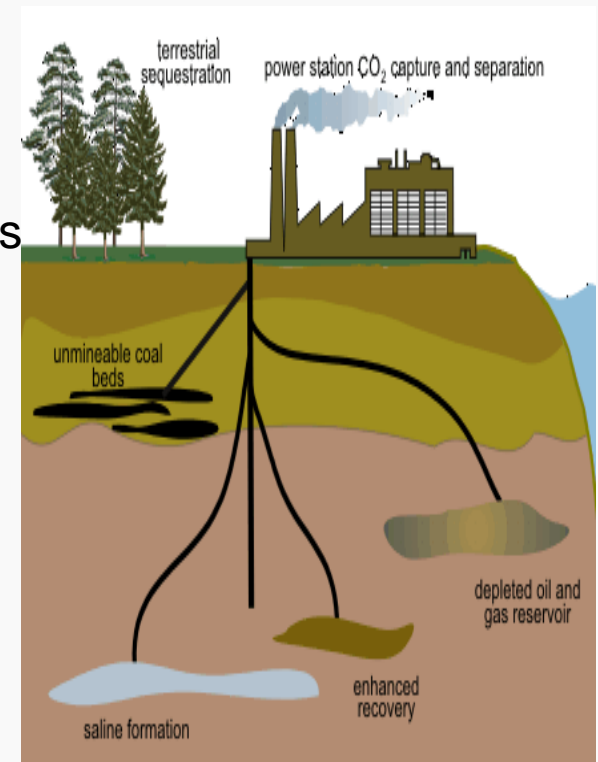
**Goal:** Increase the use of renewable, low-carbon fuels in motor vehicles (to 36 billion gallons by 2022) and decrease GHG emissions

- Required by the Energy Independence and Security Act of 2007
- Renewable fuels must achieve greenhouse gas emission reductions compared to the gasoline and diesel fuels they replace
- Substantial environmental and energy security benefits



# Carbon Capture and Sequestration

- CCS Task Force
  - In Feb 2010, the President established an interagency CCS Task Force, co-chaired by EPA and DOE.
  - In Aug 2010, the Task Force delivered a series of recommendations to the President on overcoming the barriers to the widespread, cost-effective deployment of CCS within ten years.
- Recent EPA rulemakings
  - Drinking Water Protection (SDWA): Final rule to protect underground sources of drinking water
  - GHG Reporting (CAA): Final rule to track the amount of CO<sub>2</sub> that is sequestered



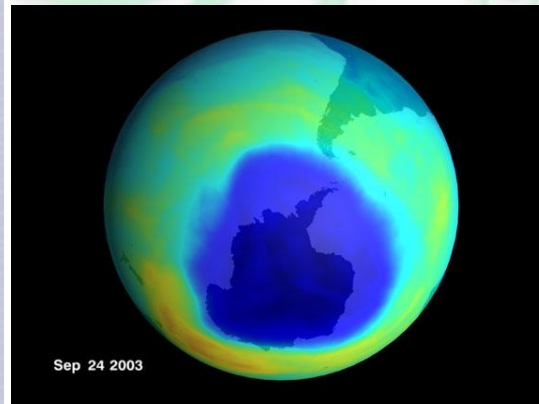


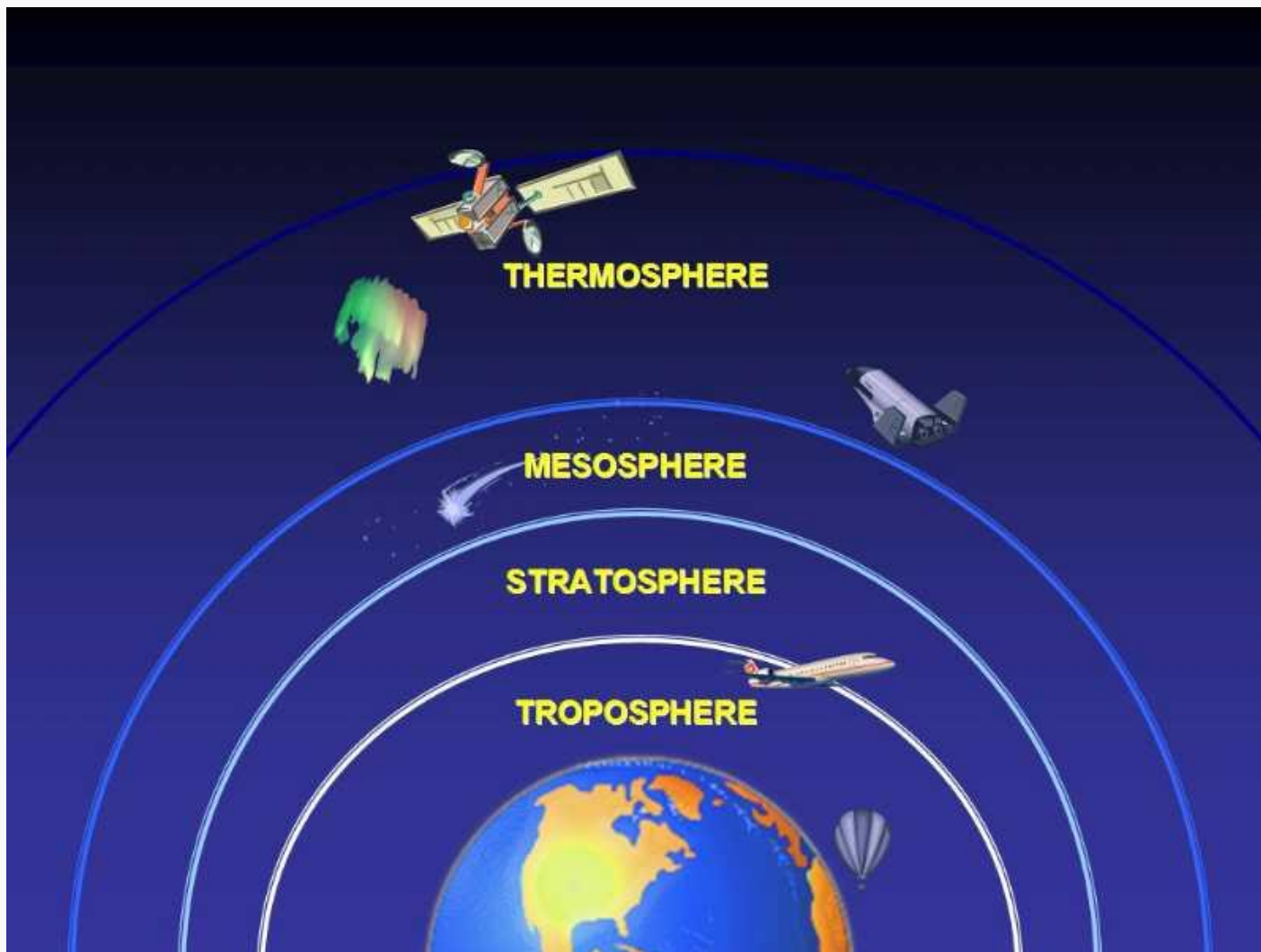
# Additional Voluntary Domestic Programs

- ENERGY STAR
- SmartWay
- Green Power Partnership
- Combined Heat and Power Partnership
- Clean Energy Environmental State Partnership
- Voluntary Methane Partnership Programs



# **Title VI of the Clean Air Act: Protecting Stratospheric Ozone with Climate-Friendly Approaches**



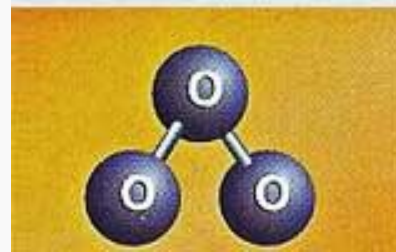




# The Ozone Layer

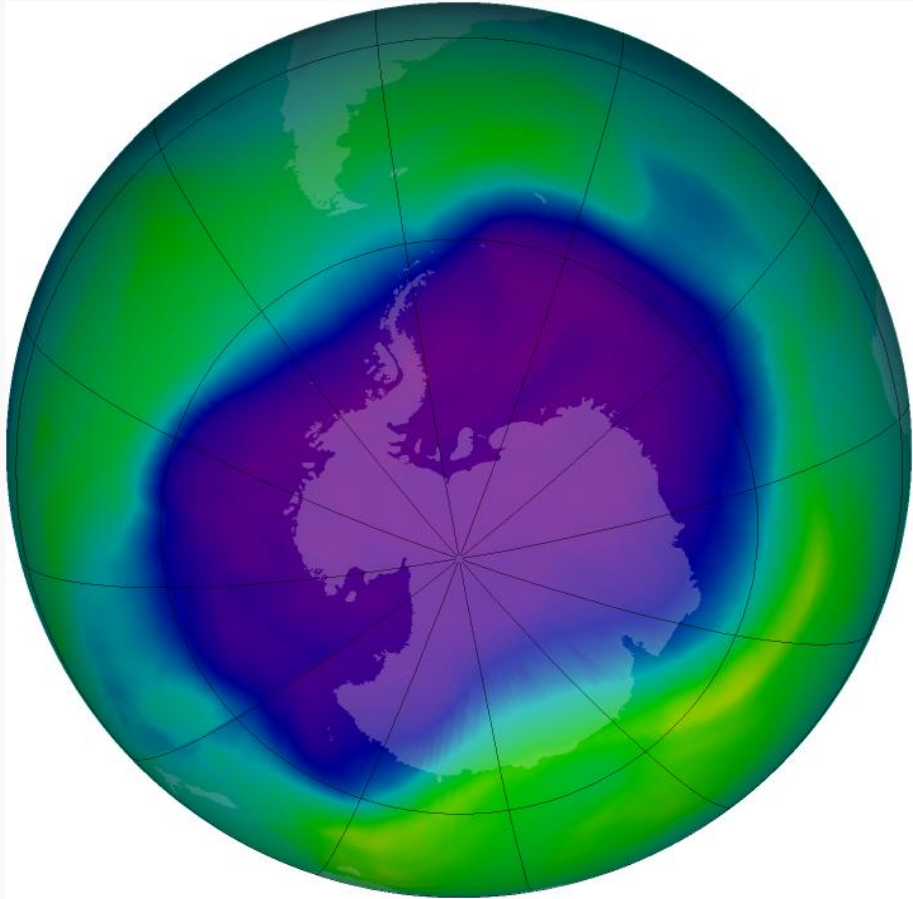
- Stratospheric ozone is a naturally-occurring gas that filters the sun's ultraviolet (UV) radiation. A healthy ozone layer protects the earth and people from too much UV radiation.
- For people, overexposure to UV rays can lead to skin cancer, cataracts, and weakened immune systems.
- Increased UV can also lead to reduced crop yield and disruptions in the marine food chain.
- During the 1980s, scientists observed that the stratospheric ozone layer was getting thinner.

Ozone  
Molecule (O<sub>3</sub>)





# Depletion of Stratospheric Ozone



- Some industrial and commercial chemicals (including CFCs, halons, methyl bromide) deteriorate in the stratosphere and break down ozone molecules. These are called “ozone depleting substance” or **ODS**.
- Ozone depletion allows greater UV radiation, causing skin cancer, cataracts, and ecological damage
- Some ODSs are also extremely potent greenhouse gases, which contribute to climate change.

The largest ozone hole ever observed occurred on Sept. 24, 2006 (shown above).



# Title VI Rules Cover a Variety of Areas/Products/Sectors

- Refrigeration and air-conditioning
- Motor vehicle air-conditioning (MVAC)
- Household appliances
- Foams
- Nonessential products
- Solvents and Aerosols
- Pharmaceuticals
- Fire protection



# The Montreal Protocol

- The **Montreal Protocol on Substances That Deplete the Ozone Layer** is an international treaty designed to protect the ozone layer by phasing out the production of ODS.
- Today, all UN-recognized nations have ratified the treaty and continue to phase out the production of ODS while searching for ozone-friendly alternatives.
- Title VI of the Clean Air Act Amendments require that EPA develop and carry out regulations for the responsible management (including phaseout) of ODS in the U.S.
- The MP also provides significant climate benefits.



# HFC Amendment to the Montreal Protocol

- The U.S., Canada, and Mexico jointly submitted their latest proposal to phase-down the use and production of hydrofluorocarbons (HFCs) under the Montreal Protocol on May 9, 2011.
  - Globally, this proposal can achieve significant reductions of carbon dioxide equivalent (CO<sub>2</sub>eq) .
- The problem of HFCs is closely linked with the phaseout of ozone-depleting substances. HFCs were created as alternatives to ODS but they are also potent greenhouse gases.
- The proposal recognizes that there may not be alternatives for all HFC uses and therefore uses a gradual phasedown process, as opposed to a phaseout for both developed and developing countries.



# Protecting the Ozone Layer

Ozone layer recovery is underway but will take decades (forecast to return to historical levels by 2065). EPA will continue its work to protect the ozone layer:

- **Turn off the tap:** Phase out production and import of ozone-depleting substances (ODS)
- **Find alternatives:** Work with industry under the Significant New Alternatives Policy (SNAP) program to find safe and viable alternatives to traditional ODS
- **Emission reduction:** Reduce emissions of ODS during the maintenance and disposal of air-conditioning and refrigeration equipment
- **Lead partnerships with industry:** Responsible Appliance Disposal (RAD) and GreenChill Programs
- **Prevent skin cancer now:** SunWise, a school-based voluntary education program, educates children about sun safety and protection from UV radiation



# Significant New Alternatives Policy (SNAP)

- Under the Significant New Alternatives Policy (SNAP) Program, EPA evaluates and regulates substitutes for the ODSs that are being phased out under the stratospheric ozone protection provisions (Title VI) of the Clean Air Act.
- A large number of alternatives exist that reduce overall risk to human health and the environment. The purpose of the program is to allow a safe, smooth transition away from some ODSs by identifying substitutes that offer lower overall risks to human health and the environment. The SNAP program has also led to huge **climate benefits**, as many ODS are also greenhouse gases.



# SPD Partnerships Overview

- GreenChill Advanced Refrigeration Partnership
  - Cooperative alliance between EPA, supermarket industry, refrigeration equipment, and chemical manufacturers
  - Reduce emissions of ODS, GHGs
  - Research and promote new technologies
- Responsible Appliance Disposal Program (RAD)
  - Reduces ODS emissions through proper recovery and disposal of refrigerants in home appliances
  - Reduces energy consumption, saves landfill space
  - Tribal Activities: Refrigerator recycling pilot program with Yakama Nation
- SunWise
  - Voluntary school-based education program on sun safety and UV protection
  - Over 29,000 schools registered; 5,400 other partners (museums, camps, etc)
  - Toolkit available in English and Spanish





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