

# Stratospheric Ozone Protection Under Title VI of the Clean Air Act

## Key milestones and achievements in protecting the ozone layer, from discovery of its depletion to its projected recovery

### EPA Stratospheric Ozone Protection Models

EPA developed and maintains models that are used to support the implementation of Title VI of the CAA. The **Atmospheric and Health Effects Framework (AHEF) Model** evaluates human health effects associated with ozone layer depletion. The **Vintaging Model** estimates the annual chemical emissions from industrial sectors that have used ODS in their products.

### Sun Safety Programs

In 1994 and 1998, EPA launched sun safety initiatives. The **UV Index** provides a forecast of the expected risk of overexposure to UV radiation from the sun, and the SunWise Program provides free K-8 sun safety educational materials. SunWise is currently managed by the **National Environmental Educational Foundation**.



### EPA Voluntary Partnerships that Protect the Ozone Layer

In 2006 and 2007, EPA launched voluntary programs to support and encourage industry to take actions beyond federal requirements. The **Responsible Appliance Disposal (RAD) Program** encourages best practices while disposing of refrigerated appliances, and **GreenChill** works with supermarkets to reduce harmful refrigerant emissions.



## DISCOVERY

- 1974** Scientists discovered that chlorofluorocarbons (CFCs), a class of chemicals containing chlorine, can destroy ozone molecules when broken down, posing a threat to the stratospheric ozone layer.
- 1978** The United States banned the use of CFCs as a propellant in certain consumer aerosol products.
- 1985** The United States signed the Vienna Convention for the Protection of the Ozone Layer.
- 1987** The United States signed the Montreal Protocol.

**1990** The CAA Amendments, including Title VI, Stratospheric Ozone Protection, were signed into law.



- 1992–1994** EPA took first actions under Title VI of the CAA:
  - Established requirements to manage the release of refrigerants for both motor vehicles and stationary refrigeration and air conditioning systems.
  - Banned the sale of nonessential products, including aerosols and foam, containing CFCs and hydrochlorofluorocarbons (HCFCs).
  - Required labeling of products containing or made with the most harmful ODS.
  - Phased out production and import of halons, a potent ODS used for fire suppression.
  - Established the Significant New Alternatives Policy (SNAP) Program to identify safer substitutes for ODS.



**1996** Phased out production and import of the most harmful ODS—which include CFCs, carbon tetrachloride, and methyl chloroform—with limited exceptions.

**2003** Phased out production and import of HCFC-141b, a commonly used foam blowing agent, with limited exceptions, marking the first reduction step in the “worst first” phaseout of HCFCs.



**2005** Phased out production and import of methyl bromide, a fumigant used to control pests in agriculture and shipping, with limited exceptions.



**2010**

- Banned production and import of HCFC-22, the most widely used refrigerant, and -142b except for servicing existing equipment.
- Banned the manufacture and import of refrigeration and air conditioning units containing HCFC-22.
- Production and import of CFCs and halon phased out globally.



**2015**

- Required labeling of products containing or made with HCFCs.
- Production and import of HCFCs only allowed for servicing existing air conditioning, refrigeration, and fire suppression equipment.

**2020** Phased out all HCFCs with the exception of HCFC-123 and HCFC-124 for servicing existing air conditioning, refrigeration, and fire suppression equipment.



**2030** The United States will phase out the production and import of all HCFCs.

**2040** HCFC production and import will be phased out globally.



**2060–2075** Scientists project the stratospheric ozone layer will recover to pre-1980 levels.

## RECOVERY

