

Ethylene Oxide 101 Webinar Logistics

Logística del seminario web sobre óxido de etileno (Ethylene Oxide) 101

Hướng Dẫn cho Buổi Hội Thảo trên mạng về Ethylene Oxide 101

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U.S. Environmental Protection Agency

Ethylene Oxide 101 Webinar Logistics



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U.S. Environmental Protection Agency

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If you have questions or comments, an electronic mailbox is available at R6EthyleneOxide@epa.gov

Questions and Answers will be posted to EPA's webpage for:

Louisiana: <https://www.epa.gov/la/air-issues-louisiana>

Texas: <https://www.epa.gov/tx/air-issues-texas>



U.S. Environmental Protection Agency

Ethylene Oxide 101

An EPA Air Toxics Webinar

May 20, 2021

U.S. Environmental Protection Agency

Webinar Objectives

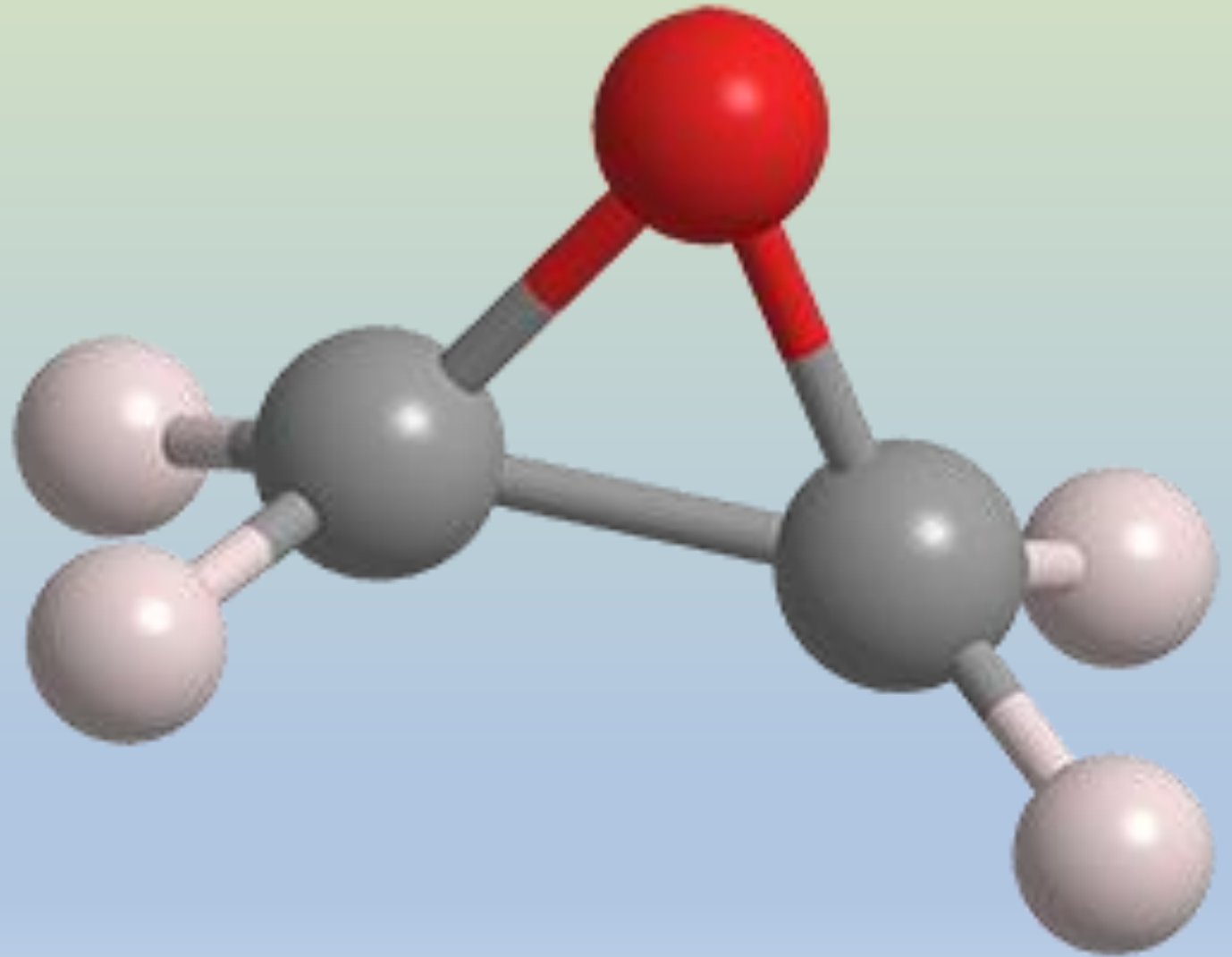
Discussion Questions:

- **What is ethylene oxide (EtO)?**
- **Why is ethylene oxide important right now?**
- **What is EPA doing about ethylene oxide?**
 - How does EPA regulate ethylene oxide?
 - What are the next steps?

What is ethylene oxide?

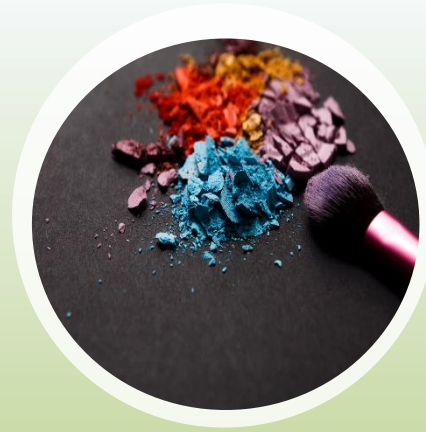
What is Ethylene Oxide?

- Is a colorless gas at room temperature
- Is flammable
- Is used to make other chemicals
- Is a sterilizing agent
- Is found in nature



What is Ethylene Oxide Used for?

- To manufacture things we use every day
- Makes ethylene glycol, which is a key ingredient in a variety of consumer household products

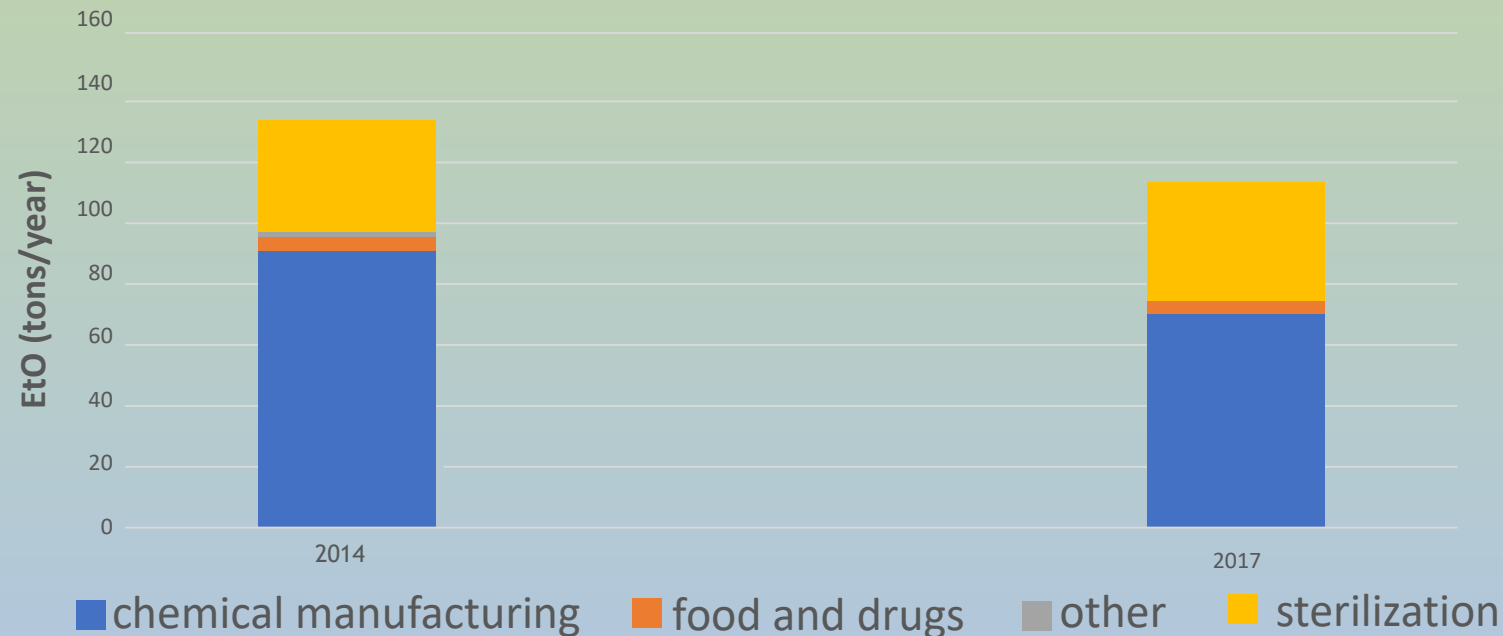


What Else is Ethylene Oxide Used for?

- To sterilize things that cannot be sterilized by other methods, such as steam or radiation
 - Medical equipment used by doctors and hospitals across the country
 - Surgical equipment and supplies
- To fumigate certain items that cannot get wet



Sources of Ethylene Oxide Emissions Nationwide



Ethylene Oxide Emissions (tons)
from National Emission Inventory Point Data Category

What are the Health Effects of Ethylene Oxide?

Acute symptoms: May cause eye/skin/respiratory irritation, headache, nausea

Chronic symptoms: May cause cancer, mutagenic changes, neurotoxicity

Why is ethylene oxide important now?

A Little History

2016: [Integrated Risk Information System \(IRIS\)](#)
evaluation completed in December

2018: EPA's [National Air Toxics Assessment \(NATA\)](#)
maps released in August

2020: EPA Office of Inspector General's Management Alert
issued in March

EPA Region 6

Areas Listed in the EPA's OIG Management Alert



Human Health Concerns

- Risk to get cancer from breathing ethylene oxide is based on exposure for 24 hours a day for 70 years
- One-time, short-term exposure to low amounts of ethylene oxide should not cause immediate harm to a person's health
- Types of cancer potentially associated with long-term ethylene oxide exposure: lymphoma, leukemia, breast cancer

What is EPA doing about ethylene oxide?

EPA's Current Response Strategy: Prong 1

Review Clean Air Act regulations for facilities that emit ethylene oxide

Regulation: a rule that sets the limits on what can be done and how much pollution can be emitted or released

EPA Regulations for Ethylene Oxide Emissions

Industries

- 40 CFR. Part 63, Subpart FFFF: Miscellaneous organic chemical manufacturing
- 40 CFR Part 63, Subpart PPP: Polyether polyols production
- 40 CFR Part 63, Subparts F, G, H, and I: Synthetic organic chemical manufacturing industry
- 40 CFR Part 63, Subpart EEEE: Organic liquids distribution (non-gasoline)

Sterilizers

- 40 CFR Part 63, Subpart O: Ethylene oxide-emitting (commercial) sterilization facilities
- 40 CFR Part 63, Subpart WWWW: Hospital sterilizers

EPA's Current Response Strategy: Prong 2

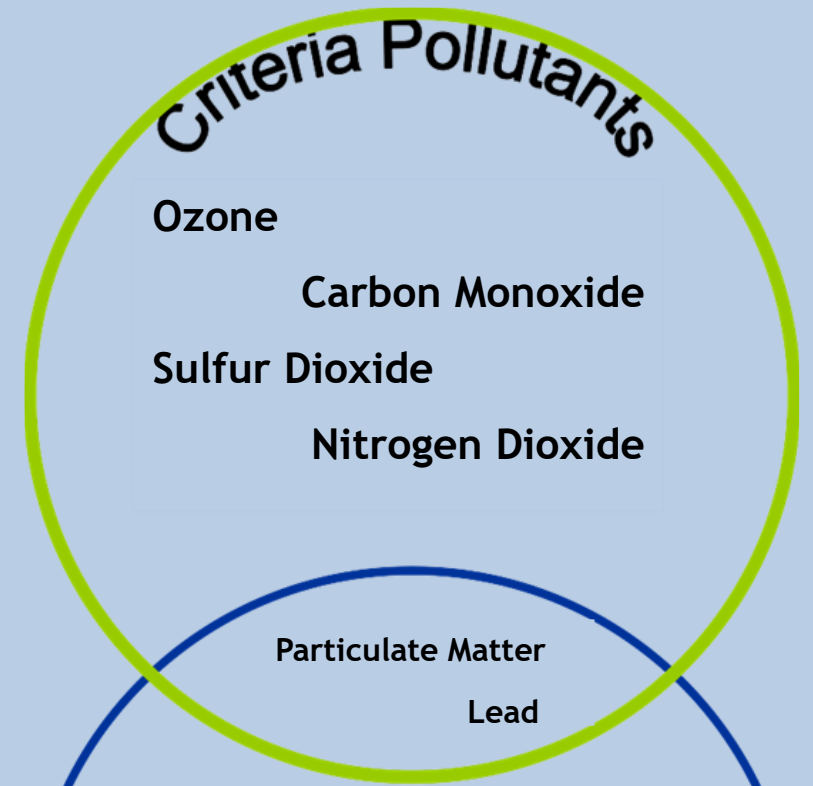
Identify ways to reduce emissions

- Work with state agency partners to gather updated ethylene oxide facility emissions
- Discuss voluntary controls with industries

How does EPA regulate ethylene oxide for better air quality?

A Little Background: Criteria Pollutants vs Air Toxics

What are “Criteria Pollutants”?



What are “Air Toxics”?



What are Criteria Pollutants?

- **Air quality standards**

- **Six pollutants**

- Ozone
- Particulate matter
- Carbon monoxide
- Sulfur dioxide
- Nitrogen oxide
- Lead

- **Health effects**

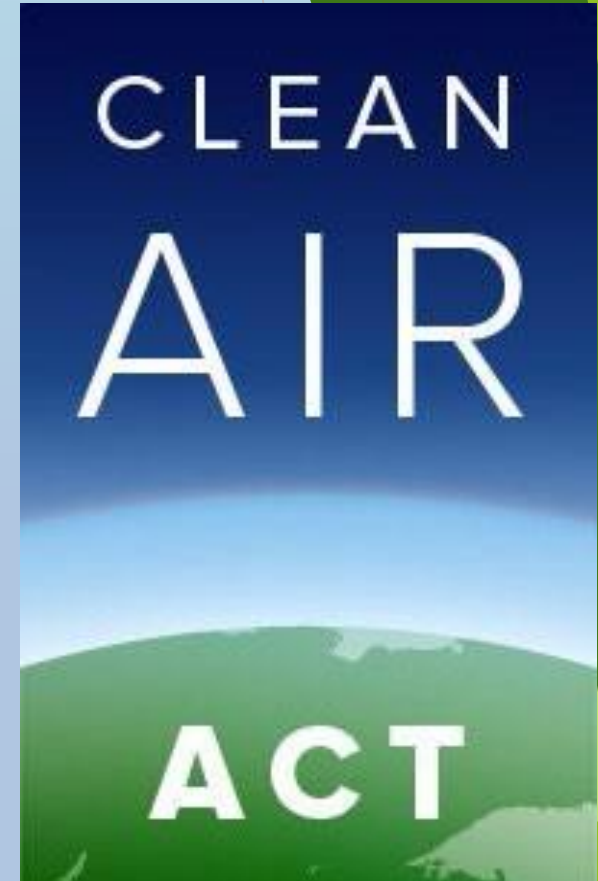
What are Air Toxics?

- **Hazardous air pollutants**
- **Based on industry categories or sectors**
- **187 pollutants**
- **Health and environmental effects**

Categorizing Air Toxics Sources

Two sources of toxic air pollutants

- “Major sources” of air toxics
 - Releases more than 10 tons per year of one hazardous air toxic
 - Releases 25 or more tons per year of a combination of hazardous air toxics
- “Area sources” of air toxics
 - Releases 10 or less than 10 tons per year of one contaminant or
 - Releases less than 25 tons per year of a combination of hazardous air toxics



Identifying NESHAP Types

Two types of technology-based standards for National Emission Standards for Hazardous Air Pollutants

- Maximum Achievable Control Technology Standards
- Generally Available Control Technology Standards



Revising a Standard to Reduce Emissions

Maximum Achievable Control Technology standards: Required reviews

- Residual risk review
- Technology review

Upcoming Regulatory Reviews Associated with Ethylene Oxide Emitting Facilities

- Commercial Sterilizers: Quarter 4, Fiscal Year (FY) 2022
- Hospital Sterilizers: Quarter 4, FY 2023
- Group 1 Polymers and Resins: Quarter 2, FY 2024
- Synthetic Organic Chemicals Manufacturing Industry: Quarter 2, FY 2024
- Polyether Polyols Production: Quarter 4, FY 2024
- Chemical Manufacturing Area Sources: Quarter 4, FY 2024

What are EPA's next steps?

1. We are continuing to review and revise our regulations
2. We are working with the States and industries in EPA Region 6 to review the industrial processes
3. This summer, we will host community meetings in specific communities
4. We continue to work to attain and improve air quality in our local environment

What We Discussed

Discussion Questions:

- **What is ethylene oxide (EtO)?**
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For more information:

EPA ethylene oxide website:

<https://www.epa.gov/ethylene-oxide>

NATA website: <https://www.epa.gov/nata>

Resources

- List of the 187 hazardous air pollutants: <https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications#mods>
- Overview of Clean Air Act Section 112: <https://www3.epa.gov/ttn/atw/overview.html>
- Further explanation of major and area sources and list of source categories: <https://www.epa.gov/ttn/atw/pollsour.html>
- List of all NESHAP/MACT final rules: <https://www.epa.gov/stationary-sources-air-pollution/list-national-emission-standards-hazardous-air-pollutants-neshap>
- Overview of the risk and technology review program: <https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html>
- Plain English Guide to Clean Air Act: <https://www.epa.gov/clean-air-act-overview/plain-english-guide-clean-air-act>
- State, local, tribal and federal partnerships: <https://www.epa.gov/haps>



Please submit additional questions to R6EthyleneOxide@epa.gov

Envíe preguntas adicionales a R6EthyleneOxide@epa.gov

Xin gửi mọi thắc mắc tới R6EthyleneOxide@epa.gov

Answers will be posted to EPA's webpage for:

TX <https://www.epa.gov/tx/air-issues-texas> and LA <https://www.epa.gov/la/air-issues-louisiana>

Las respuestas se publicarán en la página web de la EPA para:

TX <https://www.epa.gov/tx/air-issues-texas> y LA <https://www.epa.gov/la/air-issues-louisiana>

Câu trả lời sẽ được đăng trên mạng của EPA cho TX tại <https://www.epa.gov/tx/air-issues-texas> và cho LA tại <https://www.epa.gov/la/air-issues-louisiana>



Thank you!