

Pollution Control Devices



The goal of pollution control devices is to keep our air and water clean.

Brief History of Pollution Control Devices

Pollution control has been a struggle for centuries. As early as the 13th century, air pollution was considered a problem. This problem worsened with the Industrial Revolution, beginning in the 18th century, in which advances in technology lead to increased air and water contamination. Such pollution continues to result in air and water contamination, health issues, climate change, and extinctions to this day. **Pollution control devices** aim to reduce pollution, and, by extension, the harm it causes. Pollution control became a major goal in the United States with the establishment of the Environmental Protection Agency (EPA) in 1970 and subsequent air and water regulations. Innovations in pollution control devices and pollution regulations have progressed in recent years. However, many countries are unable to afford pollution control and/or do not have sufficient regulations, leading to families resorting to contaminated water for hydration and high air pollution. For example, in developing countries, 70% of industrial waste is not treated before being offloaded into the water system. Until the 1970s, sewage in United States cities was similarly handled: piped untreated into nearby bodies of water. Drinking contaminated water may cause several serious negative health effects, including gastrointestinal illnesses such as giardia and salmonellosis, and liver infections such as hepatitis. Air pollution can lead to asthma and other respiratory problems.



Water contamination can cause severe health problems.



Air pollution causes respiratory problems.

It is hoped that future innovations will lead to more efficient and affordable pollution control devices.

This article will investigate the goals and functions of three current pollution control devices.

Three Pollution Control Devices and How They Work

There are a variety of pollution control devices that have helped to decrease air and water pollution. Three such devices are **sewage treatment plants**, **thermal oxidizers**, and **catalytic**

converters. However, these are just an example of the many other pollution control devices currently in use, including filters, settling chambers, cyclone collectors, and scrubbers.

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Many industries use **thermal oxidizers** to reduce air pollution. Industrial pollution is sent to a chamber where it is *oxidized* – chemically combined with oxygen at high temperatures. This oxidation process destroys contaminants, and the remaining gas is released into the atmosphere in the form of CO₂, water vapor, and heat.

The **catalytic converter** was invented in 1975 after the EPA established regulations for toxic emission reduction. Catalytic converters are used to convert harmful pollutants from automobile engines into less harmful emissions before the pollutants are released



Catalytic converters reduce harmful automobile exhaust emissions.

into the atmosphere. Catalytic converters produce a *redox reaction* – simultaneous oxidation and reduction reactions. A *reduction* reaction is the opposite of an oxidation reaction: an oxygen is lost from a reactant. These simultaneous reactions convert 98% of harmful fumes into less harmful products, such as carbon monoxide into carbon dioxide with the addition of an oxygen. Although catalytic converters have greatly aided in reducing contaminants in the environment, emissions from motor vehicles are still the leading cause of air pollution in the United States.

Current Applicability of Pollution Control Devices

Pollution control devices are applied in many areas of industrial work. Since the Clean Air Act (1970) and Clean Water Act (1972), regulations for industrial and automotive pollution in the United States have increased, resulting in less loss of life due to environmental accidents. Pollution control devices have also been important in decreasing and reversing the effects of climate change.



In Vietnam, many people wear masks to protect themselves from air pollution.

Not all countries have strict regulations or access to pollution control devices. For example, many citizens in China and Vietnam must wear masks to prevent diseases that may result from the dense pollution in the atmosphere. A lack of awareness and regulations in these countries is often blamed

for such extreme conditions. With increasing awareness about pollution control, governments can establish pollution control policies and individuals can make educated decisions about appropriate personal choices.

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Controversy

The biggest controversy surrounding pollution control devices is their expense. Many argue that there must be a balance between regulations and affordability. Until more efficient methods are found, some believe that stricter regulations should be put on hold. Others argue, however, that



Pollution control devices are expensive.

climate change resulting from pollution must be swiftly dealt with if health issues and species extinctions are to be avoided.

Impact of Pollution Control Devices on the Environment

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The Future of Pollution Control

Future innovations may make pollution control both more efficient and more affordable. Many companies are racing to be the first to invent the next big pollution control device. Cleaner air and water will only further decrease pollution-related deaths and health problems.

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Reading Comprehension Questions

1. What are some consequences of air and water contamination?
2. Name
3. What does it mean when something is “oxidized.”
4. What
5. What may be the biggest controversy regarding pollution control devices?
6. What happened

Extension Questions

7. What is your stance on
8. Are there any personal decisions

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