



**Environmental
Protection Network**

Breathing Easy

An Assessment of Public Health Benefits
from EPA Air Pollution Standards (2021-24)

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“America needs a strong EPA.

An EPA that can respond to the communities shattered by catastrophic wildfires and hurricanes...

An EPA that partners with the advocates who have dedicated their lives to fighting for cleaner air, safer water, and healthier communities...

An EPA that empowers the parents who are working tirelessly to protect their children from PFAS and lead exposure...

And an EPA that invests in young leaders who are dedicating their lives to protecting our planet.”

— EPA Administrator Michael Regan, [2024](#)

I. Executive Summary

Environmental Protection Network (EPN), an association of 650 former Environmental Protection Agency (EPA) staff who volunteer their time to support EPA’s mission, analyzed sixteen major EPA air pollution rule updates issued from 2021 to 2024. Based on data published by EPA for these rules, EPN concludes that the air pollution reductions from smokestacks, tailpipes, and pipelines will:

- ❖ Save over 200,000 lives through 2050. That’s the equivalent of a convoy of thousands of buses stretching along the highway from Philadelphia to New York City. The children, grandparents, moms, and dads on those buses will live longer, healthier lives thanks to these rules.
- ❖ Avoid over 100 million asthma attacks in the United States through 2050. That means fewer missed school days, missed work days, and trips to the school nurse or the emergency room.
- ❖ Deliver over \$250 billion in net benefits annually, with total monetized public health and climate benefits exceeding regulatory costs by a ratio of six-to-one. That is, the public health and climate benefits of the rules will exceed compliance costs by trillions of dollars through 2050

These figures likely *significantly underestimate* the benefits of EPA’s regulatory updates for two reasons. First, this assessment focused on air pollution regulations and therefore reflects only a portion of EPA’s recent achievements. EPA’s work on toxic chemicals, clean water, and other environmental threats likely multiply these numbers. Second, numerous health benefits are often left unquantified in EPA assessments due to technical limitations, including the health benefits of reducing a number of hazardous air pollutants known to be dangerous carcinogens and otherwise harmful to human health, including benzene, formaldehyde, arsenic, lead, and more.

The **EPA** has updated **16** major air pollution rules since 2021.
That means clean air and stronger health protections.

200,000+
LIVES SAVED THROUGH 2050



100 MILLION
ASTHMA ATTACKS AVOIDED THROUGH 2050

\$250 BILLION
DELIVERED IN ANNUAL BENEFITS THROUGH 2050



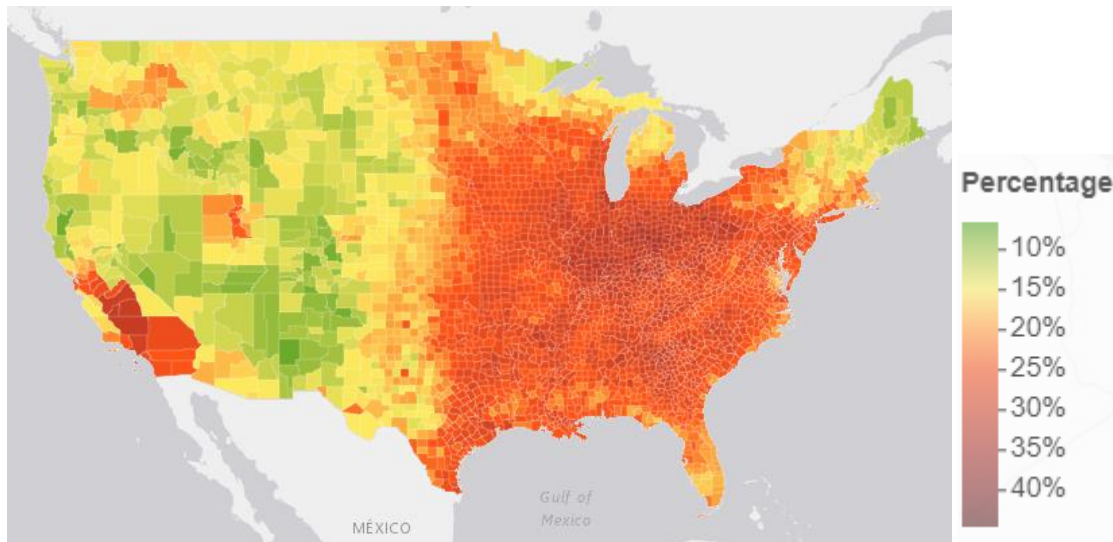
LIFE WITH ASTHMA

Asthma is one of the most common and costly diseases in the United States. Imagine trying to live your life while struggling to breathe. That's what life is like for the asthmatic children and adults who have uncontrolled asthma, frequently sending them to the emergency department or forcing them to miss work.

- ◆ One in 12 people in the U.S. have asthma. That's over 27 million people, including 4.5 million children!
- ◆ Asthma is a leading chronic disease in children.
- ◆ Asthma rates are highest in American Indian or Alaska Native adults, and non-Hispanic Black children are nearly 2 times more likely to have asthma compared to non-Hispanic White children.
- ◆ Asthma accounts for 5 million doctors' office visits and one million emergency department visits annually.
- ◆ Severe asthma can also be fatal; an average of 10 Americans die every day because of it.

Source: [Asthma and Allergy Foundation of America](#)

BURDEN OF CHILDHOOD ASTHMA DUE TO PM 2.5 (2010)



Source: [Texas A&M \(2019\)](#)

II. Overview of EPA Accomplishments, 2021-2024

By the end of President Donald Trump’s four years in office nearly 700 had scientists [left](#) EPA. Ignoring advice from staff scientists, Trump’s political appointees orchestrated a series of regulatory rollbacks undermining America’s bedrock environmental laws, including the Clean Air Act and the Clean Water Act. The rollbacks came with potentially heavy public health costs—millions of avoidable asthma attacks, emergency room visits, heart and respiratory illnesses, and premature deaths.

In 2020, EPN, supported by six former EPA administrators who served in Republican and Democratic administrations, offered a [blueprint](#) to “Reset the Course of EPA.” It addressed the most significant and pervasive threats to public health and our environment. Many of its recommendations were advanced by the Biden administration to correct damaging actions by the Trump administration that limited health protections.

By any standard, EPA has undergone an impressive reset in the past three and a half years. EPA has:

- ❖ [Reestablished scientific integrity](#) at EPA and reversed Trump EPA rules intended to [undermine science](#), including [benefit-cost analysis](#);
- ❖ [Issued 60 final rules](#), including historic actions to address climate pollution, boost environmental justice, and protect America’s waters, air, and lands; and
- ❖ Invested tens of billions of dollars in underserved communities, to support clean air, clean water, and clean energy.

PROTECTING PUBLIC HEALTH AND DRINKING WATER

In the past three years, EPA has also taken huge strides to protect public health and drinking water, including:

- ❖ [Stronger clean air standards](#) to reduce harmful soot pollution — preventing up to 4,500 premature deaths and 290,000 lost workdays. This yields up to \$46 billion in net health benefits in 2032. According to EPA, for every \$1 spent to meet the new fine particle air quality standards, there could be as much as \$77 in human health benefits in 2032;
- ❖ The [first-ever national drinking water standard](#) to protect 100 million people from “forever chemicals” (PFAS) pollution;
- ❖ Funding replacement of more than 220,000 lead service lines to ensure healthier drinking water for communities across the country;
- ❖ A [ban](#) on ongoing uses of asbestos linked to more than 40,000 deaths in the U.S. each year; and
- ❖ A [proposal](#) for stronger air pollution standards for municipal solid waste incinerators.

A FOCUS ON ENVIRONMENTAL JUSTICE

EPA has taken unprecedented steps to advance environmental justice. EPA elevated environmental justice to its highest levels, [establishing](#) a new Office of Environmental Justice and External Civil Rights with more than 200 staff focused on solving environmental challenges in underserved communities.

In April 2024, EPA [strengthened](#) clean air standards for chemical plants in order to reduce the number of people with elevated cancer risk in nearby communities by 96%.

Under the Inflation Reduction Act (“IRA”), the EPA is making the largest investment in environmental justice history, [awarding \\$3 billion](#) to help thousands of communities overcome the legacy of toxic pollution. To put this funding in perspective, it is 80 times more money than EPA has [awarded over the last 30 years](#) under its Environmental Justice Small Grants Program.

COMBATING CLIMATE CHANGE

Over the past three years, EPA has updated a number of critical rules to cut future climate pollution from the leading sources of emissions, including:

- ❖ A [Carbon Pollution Plan](#) to cut emissions from coal and natural gas power plants that will avoid more than 1.3 billion metric tons of greenhouse gas pollution, which is equivalent to preventing emissions from 328 million gasoline cars for one year.
- ❖ [New standards](#) to reduce harmful air pollutants from new passenger cars, light trucks, and larger pickups and vans, which EPA estimates will reduce 7.2 billion metric tons of CO₂ over the life of the program;
- ❖ A [final rule](#) that will sharply reduce methane, a climate “super pollutant,” and other air pollutants from the oil and natural gas industry;
- ❖ A [proposed rule](#) that assesses a fee on large emitters of methane from the oil and gas sector (as authorized in the IRA);
- ❖ A [final rule](#) to cap and phase down the production and consumption of hydrofluorocarbons (HFCs), which are potent greenhouse gasses; and
- ❖ The strongest-ever greenhouse gas [standards](#) for heavy-duty vehicles. (EPA estimates the standards will avoid 1 billion tons of greenhouse gas emissions and also reduce dangerous air pollution, especially for the 72 million people in the United States who live near truck freight routes.)

“This is the challenge of our collective lifetimes. The existential threat to human existence as we know it. And every day we delay, the cost of inaction increases... So let this be the moment that we answer history’s call.”

— President Biden, 2021

BROAD PUBLIC AND STAKEHOLDER SUPPORT FOR EPA'S ACTIONS

EPA has taken an approach that is ambitious and meticulous with attention to law and science, ensuring agency actions are more durable in the courts. Many of EPA's actions have won praise not only from [public health organizations](#) and [environmental groups](#), but also from labor and businesses.

The United Auto Workers, for example, [applauded](#) EPA for “taking seriously the concerns of workers and communities” when finalizing the agency's landmark clean car rule, which will eliminate billions of tons of pollution from tailpipes.

A number of major oil companies [praised EPA](#) for its [final rule](#) that will slash methane emissions from oil and gas operations by 80%.

Some of the biggest, highest impact actions taken in the past three plus years by EPA enjoy strong, bipartisan public support. For example, [82% of voters support](#) EPA setting stricter limits on power plant pollution, [78% of voters support](#) EPA's new, stricter clean air standards for soot, and [72% of voters support](#) EPA's new rule setting tighter limits on carbon emissions from heavy-duty vehicles.

PRODUCING A STRONGER ECONOMY, SAFER ENVIRONMENT, AND BETTER HEALTH

EPA is making unprecedented investments to build a clean energy economy, tackle climate change, and protect public health. These investments are leveraging vast amounts of private capital in support of these goals. The overall impact is an expansion of aggregate investment with a growth-inducing effect on the US economy. Pursuant to the 2022 IRA and the 2021 Bipartisan Infrastructure Law, EPA is investing:

- ❖ \$7 billion in grants to [install affordable community solar](#) for 900,000 low-income and disadvantaged households nationwide;
- ❖ \$20 billion in grants to finance tens of thousands of [clean energy and climate solution projects](#), ensuring communities have access to the capital they need to participate in and benefit from a cleaner, more sustainable economy;
- ❖ [\\$50 billion dollars](#) to replace lead pipes, protect our nation's treasured waters, and build drinking water and wastewater systems that are resilient to the climate crisis;
- ❖ \$5 billion dollars for [cleaner school buses](#), reducing pollution exposure and risk for millions of kids across this country as they go to and from school;
- ❖ \$5 billion to clean up Superfund and brownfield sites in every region; and
- ❖ \$3 billion in clean ports [investments](#), funding zero-emission port equipment.

III. Assessment of Health Benefits

This report compiles economic impact and health incidence data from Regulatory Impact Analyses (RIAs) prepared for 16 different economically significant rules finalized during the past three years by the EPA’s Office of Air and Radiation (OAR).

RESULTS – MONETIZED COSTS AND BENEFITS

From the 16 air quality rules analyzed for this report, total monetized benefits, including health and climate benefits, total \$303 billion dollars on an annualized basis. Total costs, including compliance and implementation costs, add up to \$50 billion dollars, resulting in total net benefits of \$253 billion dollars. That’s a benefits-to-cost ratio of six-to-one.

RULE	ANNUAL COSTS* (2023 \$, IN MILLIONS)	ANNUAL BENEFITS* (2023 \$, IN MILLIONS)	ANNUAL NET BENEFITS* (2023 \$, IN MILLIONS)
<u>Air Quality Standards for Fine Particle Pollution (Soot)</u>	\$573	\$43,903	\$43,330
<u>Boiler Rule</u>	\$62	\$150	\$88
<u>Carbon Pollution Standards for Fossil Fuel-Fired Power Plants</u>	\$1,067	\$23,568	\$22,501
<u>Clean Car Rule (2027)</u>	\$28,945	\$125,290	\$96,345
<u>Clean Trucks Rule (Phase 3)</u>	\$1,137	\$11,371	\$10,234
<u>Cross-State Air Pollution Rule</u>	\$31	\$3,463	\$3,432
<u>Federal Good Neighbor Rule</u>	\$1,130	\$17,342	\$16,212
<u>Gasoline Distribution Facilities and Terminals Standards</u>	-\$4	\$19	\$23
<u>Heavy-Duty Vehicle Standards</u>	\$4,634	\$21,952	\$17,317
<u>HFC Phasedown (Allocation Framework)</u>	-\$646	\$15,739	\$16,385
<u>HFC Phasedown (Technology Transitions Rule)</u>	-\$569	\$360	\$929
<u>Iron and Steel NESHAP</u>	\$5	\$207	\$201
<u>Light Duty Vehicle Emissions Standards (Model Years 2023 and Later)</u>	\$11,684	\$29,567	\$17,883
<u>Mercury and Air Toxic Standards</u>	\$108	\$53	-\$55
<u>Oil & Gas Methane Rule</u>	\$1,759	\$10,600	\$8,841
<u>Polymers and Resins Rule</u>	\$166	\$7	-\$159
TOTAL	\$50,082	\$303,591	\$253,509

*Equivalent Annualized Value, 3% Discount Rate

RESULTS – HEALTH BENEFITS

EPN analyzed the health benefits of the ten air pollution rules since 2021 that have the most significant quantified health impacts. Health incidence benefits were compiled for three categories, chosen because of the inclusiveness and confidence in the statistical data supporting analysis, with the following results:

- ❖ 202,632 avoided all-cause premature mortality.
- ❖ 107 million avoided symptomatic asthma incidents.

94 million avoided minor-restricted activity days. Minor-restricted activity days result when individuals reduce most usual daily activities and replace them with less strenuous activities or rest, yet not to the point of missing work or school.

RULE	Avoided Premature Mortality	Avoided Symptomatic Asthma Incidents	Avoided Minor Restricted-Activity Days
<u>Air Quality Standards for Fine Particle Pollution (Soot)</u>	85,595	15,200,000	32,300,000
<u>Carbon Pollution Standards for Fossil Fuel-Fired Power Plants</u>	14,973	5,168,800	5,142,000
<u>Clean Car Rule (2027)</u>	3,026	1,043,857	2,267,465
<u>Clean Trucks Rule (Phase 3)</u>	142	48,769	106,746
<u>Cross-State Air Pollution Rule</u>	4,999	5,940,010	3,060,010
<u>Federal Good Neighbor Rule</u>	35,800	33,214,000	18,568,000
<u>Heavy-Duty Vehicle Standards</u>	54,580	43,790,000	29,870,000
<u>Light Duty Vehicle Emissions Standards (Model Years 2023 and Later)</u>	1,778	865,622	1,921,705
<u>Mercury and Air Toxic Standards</u>	52	7,466	13,536
<u>Oil & Gas Methane Rule</u>	1,689	2,185,000	990,000
COMBINED STREAM TOTALS TO 2050	202,632	107,463,525	94,239,462

METHODOLOGY AND UNCERTAINTIES

The analysis uses estimated annualized values (EAVs) for total costs and benefits reported in each RIA, at a 3% discount rate, adjusted to 2023 dollars using the GDP deflator. The health incidence data presented report here, on a cumulative basis up to the year 2050, is compiled using a combination of methods. These reflect the differing ways in which the data is calculated by the EPA across different RIAs.

For rules where multiple single-year snapshots of health incidence data are provided, linear interpolation and extrapolation is used in correspondence with the monetized stream estimates of health benefits. For rules without health incidence snapshots, the EPA's sector-specific incidence-per-ton tables are used to produce health incidence data from estimated changes in emissions.

UNQUANTIFIED BENEFITS

EPA does not currently quantify the benefits of air pollution rules that arise from alleviating the following impacts of air pollution:

- ◆ Cancer
- ◆ Respiratory effects, including pulmonary function, non-asthma ER visits, and chronic diseases beyond bronchitis
- ◆ Nervous system effects, including autism, cognitive decline, and dementia
- ◆ Metabolic effects, such as diabetes
- ◆ Reproductive and developmental effects
- ◆ Decreased outdoor worker productivity

“The [Hazardous Air Pollutants (HAPs)] for which benefits remained unquantified include a long list of chemicals known to be dangerous to human health, like benzene, formaldehyde, polycyclic organic matter (POM), toluene, MTBE, arsenic, chromium, lead, and many more. Many of these compounds have been listed for many years as known or probable carcinogens. Many are also linked to a variety of other impacts on human health, including immunotoxicity, genotoxicity, nervous system disorders, respiratory effects, and reproductive and developmental effects.”

–Amy Sinden, [“The Problem of Unquantified Benefits,”](#) Temple University, 2019

The cumulative benefits laid out in this report only represent a subset of EPA's work, based on air pollution regulations updated since 2021. Even these estimates are highly likely to underestimate the true real-world benefits that will accrue as a result of the analyzed rules. There are a large number of different types of benefits resulting from the analyzed rules, which have not been quantified or monetized.

In addition, the analysis in this report takes a conservative approach to calculating benefits, using a 3% discount rate for future monetized benefits when in some cases a lower discount rate may be more appropriate, and using the smaller amount when multiple estimates are provided for a benefit.

Although there is some potential for double counting, it is limited by the fact that EPA estimates benefits of each rule on top of a ‘baseline’ of the then-current regulatory environment, meaning pre-existing rules are already accounted for. When multiple rules are being finalized in parallel, or rules are in different realms of EPA’s jurisdiction (for instance, air vs. water pollution), their impacts may not be represented in each rule’s RIA. This creates a risk for the summation of monetized benefits in this analysis to include some double-counting. We minimized this risk by limiting our analysis to air pollution regulations.

Using EAVs means that the combined monetized estimate may not be representative of a particular time period. This is due to differing years of analysis between RIAs and differing average estimates if narrower periods of analysis are used than in the RIAs. As such, the combined EAV estimates provided in this report should be interpreted primarily as an indication of the combined scale and impact of the analyzed rules, rather than a precise empirical evaluation of a specific year.