

Fact Sheet

Climate, Environmental, and Health Impacts of Fossil Fuels (2021)

The use of fossil fuels—coal, oil, and natural gas—results in significant climate, environmental, and health costs that are not reflected in market prices. These costs are known as externalities. Each stage of the fossil fuel supply chain, from extraction and transportation to refining and burning, generates externalities. This fact sheet provides a survey of some of the externalities associated with fossil fuels.

Fossil Fuel Impacts Include:



Acidification

Weather

Rise

Pollution

Water Pollution Pollution

Oil Spills

Health Issues

Climate Externalities

When fossil fuels are burned, they emit greenhouse gases like carbon dioxide that trap heat in the earth's atmosphere and contribute to climate change.¹ In 2019, fossil fuels accounted for 74 percent of U.S. greenhouse gas emissions.² Nearly 25 percent of emissions in the United States come from fossil fuels extracted from public lands.³ Some of the climate externalities of fossil fuels include:

- Ocean acidification: At least a quarter of the carbon dioxide emitted from fossil fuels is absorbed by the ocean, changing its chemistry (pH).¹ The increased acidity makes it harder for marine organisms to build shells and coral skeletons.⁴ Over the last 150 years, ocean acidity has increased by 30 percent, posing threats to coral reefs, fishing, tourism, and the economy.^{1,5}
- Extreme weather: According to the National Oceanic and Atmospheric Administration, climate change, brought upon • by burning fossil fuels, is contributing to more frequent and severe extreme weather events that lead to disasters costing at least a billion dollars each.⁶ The cost of extreme weather events, including wildfires, hurricanes, wind storms, flooding, and droughts, between 2016 and 2020 in the United States has been estimated at \$606.9 billion.⁶
- Sea level rise: Oceanic and atmospheric warming due to climate change is melting glaciers and land-based ice sheets, • resulting in global sea level rise.¹ Sea levels have risen about 9 inches since the late 1800s, causing more frequent flooding, destructive storm surges, and saltwater intrusion.^{7,8} With 40 percent of the U.S. population living along the coasts, it is estimated that defending coastal communities from sea level rise could cost \$400 billion over the next 20 years.⁹

Environmental Externalities

Fossil fuels have significant environmental externalities including:

Air pollution: Fossil fuels produce hazardous air pollutants, including sulfur dioxide, nitrogen oxides, particulate matter, carbon monoxide, and mercury, all of which are harmful to the environment and human health (as discussed in the health section below).¹⁰ Air pollution from fossil fuels can cause acid rain, eutrophication (excessive nutrients that can harm aquatic ecosystems by lowering oxygen levels), damage to crops and forests, and harm to wildlife.^{11,12}

- Water pollution: From oil spills to fracking fluids, fossil fuels cause water pollution. Each fracking well uses between 1.5 million to 16 million gallons of water, and the resulting wastewater can be toxic, often containing substances like arsenic, lead, chlorine, and mercury that can contaminate groundwater and drinking water.^{13,14,15}
- Plastic pollution: Over 99 percent of plastics are made from fossil fuels.¹⁶ Globally, 300 million tons of plastic waste are produced each year, 14 million tons of which end up in the ocean, killing wildlife and polluting the food chain.^{17,18} Plastics also have climate consequences: the U.S. plastic industry produces 232 million tons of carbon dioxide equivalent per year, and the industry's greenhouse gas emissions are expected to surpass those of coal-fired power plants by 2030.¹⁹
- Oil spills: Fossil fuel extraction, transportation, and refining can lead to oil spills that harm communities and wildlife, destroy habitats, erode shorelines, and result in beach, park, and fishery closures.²⁰ The largest oil spill in history, the 2010 BP Deepwater Horizon spill, released 134 million gallons of oil into the Gulf of Mexico, killing 11 people and countless birds, turtles, fish, marine mammals, and plants—and cost BP \$65 billion in penalties and cleanup costs.^{21,22}

Health Externalities

Air pollution from burning fossil fuels can cause multiple health issues, including asthma, cancer, heart disease, and premature death.²³ Combusting the additives found in gasoline—benzene, toluene, ethylbenzene, xylene—produces cancer-causing ultra-fine particles and aromatic hydrocarbons.²⁴ Globally, fossil fuel pollution is responsible for one in five deaths.²⁵ In the United States, 350,000 premature deaths in 2018 were attributed to fossil fuel-related pollution, with the highest number of deaths per capita in states like Pennsylvania, Ohio, and West Virginia.²⁵ The annual cost of the health impacts of fossil fuel-generated electricity in the United States is estimated to be up to \$886.5 billion.²⁶

The environmental and health impacts of fossil fuels disproportionately harm communities of color and low-income communities. Black and Hispanic Americans are exposed to 56 and 63 percent more particulate matter pollution, respectively, than they produce.²⁷ In a predominantly Black and low-income area of Louisiana known as "Cancer Alley," the cancer risk is nearly 50 times higher than the national average due to 150 nearby chemical plants and oil refineries.²⁸

Policy Mechanisms to Reduce Fossil Fuel Externalities

Several policy mechanisms have been proposed to reduce fossil fuel externalities, including:

- Eliminating fossil fuel subsidies, which could generate \$35 billion in taxpayer savings over the next ten years.²⁹ To learn more about policy mechanisms to phase out fossil fuel subsidies, check out EESI's fact sheet.³⁰
- Increasing the **social cost of carbon (SCC)**, which estimates the often-uncounted economic damages that result from carbon dioxide emissions. ³¹ The federal government uses SCC to evaluate the climate impacts of policies.
- A federal clean electricity standard, which would require a percentage of the electricity sold by utilities to come from clean electricity sources.³² Such standards already exist in several states and usually require the share of clean energy on the electric grid to increase over time.³³
- A carbon price, which sets a price on carbon dioxide emissions that is paid by emitters.³⁴ Carbon price policies can be structured in different ways, including as a carbon tax.³⁵ Cap-and-trade programs like the Northeast's Regional Greenhouse Gas Initiative, in which the market determines a carbon price, have existed at the subnational level for many years, reducing emissions and creating new revenue streams for clean energy investments.³⁶

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This fact sheet is available electronically (with hyperlinks and endnotes) at <u>www.eesi.org/papers</u>.

The Environmental and Energy Study Institute (EESI) is a non-profit organization founded in 1984 on a bipartisan basis by members of Congress to help educate and inform policymakers, their staff, stakeholders, and the American public about the benefits of a low-emissions economy that prioritizes energy efficiency, renewable energy, and new clean energy technologies. In 1988, EESI declared that addressing climate change is a moral imperative, which has since guided our work toward our vision: a sustainable, resilient, and equitable world.

ENDNOTES

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