Climate Change: Policy & Mitigation

The Challenge

Climate change is a global challenge that requires international cooperation. The UN Framework Convention on Climate Change (UNFCCC), ratified by nearly all nations including the U.S., aims to stabilize greenhouse gas (GHG) concentrations at levels that prevent dangerous anthropogenic (human-induced) interference with the climate system.[1] Due to the atmospheric lifetimes of GHGs (ranging from 5 to 50,000 years), significant emissions reductions are needed in the coming decades to meet the UNFCCC objective.[6] See Greenhouse Gases Factsheet.

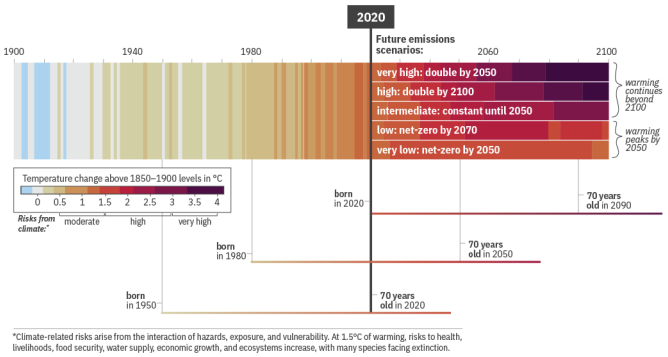
In 2023, the Intergovernmental Panel on Climate Change (IPCC) released its Sixth Assessment Report, outlining climate impacts and strategies for mitigation and adaptation. To limit warming to 1.5 °C, global emissions must fall 48% from 2019 levels (52.9G t CO_2e) by 2030, reach net-zero by 2050, and net-negative thereafter. This requires rapid and deep emission reductions across all sectors.[2] The latest Nationally Determined Contributions (NDCs) would result in 48.3–54.7 Gt CO_2e in 2030—only 2.6% below 2019.[20] In 2023, the U.S. emitted 5.96 Gt CO_2e—a 1.4% decrease from 2022—and contributed 11% of global GHG emissions as the second-largest emitting country.[4]

General Policies

Economic Instruments

- Economic instruments reduce emissions by internalizing the societal costs of pollution, enabling firms to respond with flexibility and innovation; these include carbon taxes, baseline and credit programs, subsidies, cap-and-trade programs, and clean energy standards.[5]
- In a cap-and-trade carbon permit system, emission allowances are distributed or auctioned. Parties emitting less than their allowance can sell excess permits to those exceeding their limits, creating a financial incentive to reduce emissions.[5]

Global Temperature Pathways[2]



Regulatory Instruments

- Regulatory instruments are government-enforced mandates with noncompliance resulting in financial or legal penalties; these include non-tradable permits, technology and performance standards, product bans, and government investment.[3]
- Performance standards, applied across energy and transport sectors, set targets (e.g., share of zero-emission output, maximum emissions) and allow flexibility in execution.[3]
- Regulatory instruments can be more economically costly but are more effective at targeting specific sectoral outcomes.[3]

Voluntary Agreements

- Voluntary agreements are negotiated commitments between governments and private sectors; incorporating these in policy improves cost-effectiveness for firms.[3]
- The U.S. Environmental Protection Agency (EPA) partners with multiple sectors through voluntary programs to reduce GHG emissions, promote clean energy, and support climate change adaptation.[13]

The Kyoto Protocol

- The Kyoto Protocol, which took effect on February 16, 2005, set binding GHG reduction targets for UNFCCC countries, aiming for an overall cut of 5% below 1990 levels by 2012.[14]
- After 2012, the Kyoto Protocol was amended for a second period with a new goal of reducing emissions 18% below 1990 levels by 2020.[14]

The Paris Agreement

- In December 2015, UNFCCC adopted the Paris Agreement to limit global temperature rise to below 2 °C above pre-industrial levels;[15] it took effect on November 4, 2016.[16]
- As of June 2025, the Paris Agreement had 198 signatories, 195 had ratified the agreement.[12]
- On January 20, 2025, the White House issued an executive order directing the immediate withdrawal of the U.S. from the Paris Agreement and all related UNFCCC commitments.[12,26]

Government Action in the U.S.

Federal Policy

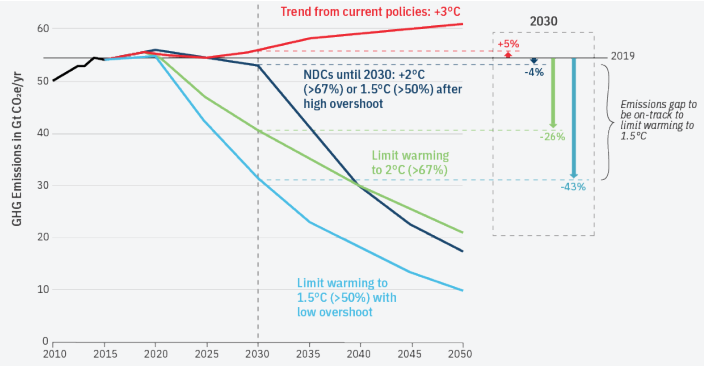
- The U.S. Energy Policy Act of 2005 aimed to establish a comprehensive national program of mandatory, market-based incentives to reduce GHG emissions without harming the U.S. economy, encouraging similar global action.[17]
- In 2007, the U.S. Supreme Court qualified GHGs as air pollutants under the Clean Air Act, subject to regulation by the EPA[7]—a 2022 ruling limited the scope of this regulation.[9]
- The Consolidated Appropriations Act of 2008 required large emitters of GHGs in the U.S. to report emissions to the EPA.[18]

- In 2023, the EPA proposed limits and guidelines for GHG emissions from new and existing fossil fuel facilities, including New Source Performance Standards (NSPS) and guidelines.[19]
- The Inflation Reduction Act of 2022 allocated funding to businesses, NGOs, and state, local, and tribal governments to support and accelerate the clean energy transition.[21]
- In 2024, the U.S. fuel economy standards for model years 2027–2031 raised the Corporate Average Fuel Economy to 50 mpg for new light-duty vehicles. The new standards are projected to save over $23B in fuel costs. See Personal Transportation Factsheet.[10]
- In January 2025, the White House revoked the International Climate Finance Plan and froze all related funding.[26] All federal agencies were directed to cease disbursement of funds from the Inflation Reduction Act of 2022, including private sector partnerships.[27]
- The EPA announced major changes in alignment with this directive including the reconsideration of climate regulations, GHG reporting requirements, clean energy initiatives, and the reversal of vehicle standards.[8]

State Policy

- State-level climate policies are primary drivers in reducing private sector GHG emissions.[11]
- 48 states and D.C. have released climate action plans.[22] 23 states and D.C. have GHG emissions reduction targets.[23]
- 28 states, D.C., and 3 U.S. territories have Renewable Portfolio Standards, specifying a set percentage of electricity to come from renewable sources by a specific date. 11 states have Clean Energy Standards, which specify the percentage of electricity generation from low- and zero-carbon sources.[24]
- A coalition of governors, representing 55% of the U.S. population and 60% of the economy, formed the U.S. Climate Alliance to pursue the Paris Agreement's target.[25]
- These states commit to the GHG reduction goal, regardless of federal policy, through carbon markets, 100% clean energy standards, and clean energy investments.[28]

Global Emissions Pathways[2]



Mitigation and Development

A gap remains between 2030 emissions projections under current pledges and the levels needed to meet global temperature goals.[3] Bridging this gap requires immediate, simultaneous transformations across all sectors[32] and coordinated action between governments and private actors.[3]

- Policy integration—aligning climate action with development goals. Effective strategies combine standards and incentives for low-carbon technologies, supply-side measures targeting fossil fuels, and targeted investments in innovation.[3]
- Strengthening Governance and Institutional Capacity—for long-term planning, knowledge integration, and international coordination—enables ambitious climate action by bridging implementation gaps, aligning policy responses, and managing competing interests.[3]
- Redirecting Financial Resources towards low-carbon investments. Carbon pricing, through taxes or cap-and-trade, efficiently discourages emissions, encourages a shift to clean energy, and generates revenue for priority actions.[3]
- Limiting warming to below 2 °C relies on significant behavioral and societal change. Aligning low-carbon lifestyles with enabling conditions—public transit systems, urban planning, infrastructure—offers greater success than policy alone.[3]
- Closing Technology and Innovation gaps in high-emitting sectors—shipping, aviation, trucking, and heavy industry—is critical for decarbonization. Transitions require not only new technologies but sustainable shifts in underlying systems.[3]

Individual Action

- 80% of people globally support stronger climate action within their countries. In the U.S., 80% support international climate cooperation—even if countries disagree on other issues.[33]
- Public support is especially strong for policies on conserving forests and land, and investing in renewable energy.[34]
- Voting for climate action, supporting local sustainability initiatives, and contacting state representatives can influence policy decisions.[29] The Climate Collaborative offers resources to help voters support climate action.[29]
- Individuals can reduce their personal emissions through energy conservation measures that also save money. See Carbon Footprint Factsheet.
- Walk, bike, carpool, use mass transit, or drive best-in-class vehicles.[39] Switching to public transit for a 20 mi round trip can prevent 4,800 lbs CO_2/yr.[30]
- Make your home more energy efficient. Purchase secondhand, reusable, or low-emission products.[39] Look for the Energy Star label on appliances.[31]
- Reduce meat consumption and food waste; compost scraps, and donate excess.[39] Plant native species to support local biodiversity.[39]

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Sources for this factsheet are here, help with units and abbreviations is here.