U.S. Climate Change Policy

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SUMMARY

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The greenhouse gases (GHGs) in the atmosphere trap radiant energy, warming earth's surface and oceans. Scientific assessments conclude that GHGs very likely have been the main driver of warming of the earth's lower atmosphere since 1979. The most recent global assessment projected that surface temperature would continue to rise until at least mid-century even under the lowest GHG emission scenarios considered. A range of actions to mitigate GHG emissions and the risks of climate change (i.e., for adaptation or resilience) are under way or being developed on the international, national, and subnational levels. U.S. federal policymakers and stakeholders have different viewpoints regarding what, if anything, to do about future climate change and related impacts.

Brief History of U.S. Climate Policy

Historically, the United States has demonstrated varying approaches and intent with regard to addressing climate change generally and to participating in GHG abatement under the 1992 United Nations Framework Convention on Climate Change (UNFCCC). International negotiations led to, among other agreements, the adoption of the Paris Agreement (PA) in 2015. President Obama accepted the PA without submitting it to the Senate for advice and consent, and the United States became a Party to the agreement when the PA entered into force in 2016. President Trump announced U.S. withdrawal from the PA in June 2017, which became effective in November 2020. President Biden again accepted the PA, and the United States became a Party on February 19, 2021.

U.S. climate change policy has involved actions implemented under various legal authorities. Prior to 2007, the federal government implemented voluntary programs to address climate change and regulatory programs that indirectly limited GHG emission increases from vehicles, appliances and equipment, and buildings. A shift toward direct regulation of GHG emissions occurred following the 2007 decision in *Massachusetts v. EPA*, in which the Supreme Court found that the Environmental Protection Agency (EPA) has authority to regulate GHG emissions from motor vehicles as air pollutants under the Clean Air Act. EPA subsequently issued rules to limit GHGs from various sources, although not all have been implemented. State and local governments have also taken a variety of actions, including emission controls on power plants and vehicles and building codes.

U.S. Legislation

Members of Congress have historically expressed a range of perspectives regarding climate change issues. Legislative proposals have included carbon pricing frameworks (e.g., carbon taxes or cap-and-trade programs), sectoral approaches such as a clean energy standard, research funding or tax policies that support GHG-abating technology development and deployment, efforts to increase adaptation, and international cooperation. On the other hand, introduced resolutions have expressed that the multisector carbon pricing approaches are not in the economic interests of the United States. Votes on comprehensive climate change policy have been relatively rare in either chamber of Congress. Examples of enacted legislation involving climate change issues include tax incentives to promote renewable energy sources and carbon capture and sequestration efforts.

Executive Branch Approach to Climate Change

President Biden announced a new GHG target for the United States: to reduce net GHG emissions by 50%-52% below 2005 levels by 2030. The Administration has also centralized executive branch organizations to identify and coordinate climate-related actions, and issued directives with a view toward decisions that support meeting the Administration's GHG reduction targets.

Issues for Congress

Congress may consider issues concerning U.S. GHG targets, policy approaches, and funding. For example, U.S. participation in the PA raises issues that Congress may consider concerning the ambition, relative level of effort, and performance of other parties' GHG mitigation, adaptation, technology, and financing associated with the PA. Differences in parties' GHG policies may have implications for trade. For example, several national governments and the EU have discussed imposing border carbon adjustments (i.e., tariffs) on imported goods from countries that do not make similarly ambitious efforts to reduce GHG emissions.

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Introduction

Millions of discrete sources throughout the U.S. economy produce carbon dioxide (CO_2) and other greenhouse gas (GHG) emissions.[1] These sources include motor vehicles, electric power plants, industrial facilities, commercial buildings, and households, among others. Human-related GHG emissions have increased since the beginning of the industrial era, unequivocally increasing atmospheric concentrations of GHGs.[2] For example, atmospheric concentrations of CO_2 have increased by over 45% compared to preindustrial levels.[3] Methane has increased by 156% over the same time frame.[4]

The GHGs in the atmosphere trap infrared radiation as heat, warming earth's atmosphere, land, and ocean. The Intergovernmental Panel on Climate Change (IPCC) concluded in 2021 that "[i]t is *very likely* that well-mixed GHGs were the main driver of tropospheric warming since 1979"[5] and that "[g]lobal warming of 1.5°C and 2°C [compared with preindustrial temperatures] will be exceeded during the 21st century unless deep reductions in CO_2 and other GHG emissions occur in the coming decades."[6]

The increasing atmospheric concentrations of GHGs have led to various changes to the climate: increases in average global temperature and related rising sea levels, changes in precipitation, and increases in frequency and intensity of some extreme weather events. The latest major U.S. scientific assessment, known as the Fourth National Climate Assessment (NCA4), concluded that the increase in GHGs is driving global land and ocean warming and other climate changes that are now unprecedented in the history of modern civilization. The second volume of the NCA4, published in 2018, concluded, inter alia, that human-induced climate change is affecting U.S. communities across the country through extreme weather events and generally warmer temperatures, more variable precipitation, and other observed trends.[7] The NCA4 describes continued and increasing disruption to infrastructure, economic, and social systems, including economic disparities. According to its assessment, projected climate change impacts are affecting, and are virtually certain to increasingly affect, the U.S. economy, trade, and other essential U.S. interests. Some stakeholders, as well as some Members of Congress, consider that the resulting

[1] The primary greenhouse gases (GHGs) emitted by human activities—and estimated by the U.S. Environmental Protection Agency (EPA) in its annual inventories—include carbon dioxide (CO_2), methane, nitrous oxide, sulfur hexafluoride, chlorofluorocarbons, hydrofluorocarbons, and perfluorocarbons. Other GHGs include carbonaceous and sulfuric aerosols, hydrochlorofluorocarbons, and elevated tropospheric ozone pollution generated by emissions of nitrogen oxides and volatile organic compounds, such as solvents.

[2] Intergovernmental Panel on Climate Change (IPCC), "AR6 Climate Change 2021: The Physical Science Basis," August 9, 2021, p. SPM-5, https://www.ipcc.ch/report/ar6/wg1/. (Hereinafter, IPCC AR6 Science.)

[3] The IPCC reported that from 1750 to 2019, CO_2 concentrations increased 47%. IPCC AR6 Science, pp. SPM-9 and 2-20.

[4] IPCC AR6 Science, pp. SPM-9 and 2-20.

[5] IPCC AR6 Science, p. SPM-6. The IPCC was established in 1988 under the auspices of the United Nations Environment Programme and the World Meteorological Organization to provide them with assessments of climate change science. For more background, see IPCC, "History of the IPCC," https://www.ipcc.ch/about/history/.

[6] IPCC AR6 Science, pp. SPM-16 to SPM-17. See also IPCC, *Global Warming of 1.5°C, Special Report*, 2018; U.S. Global Change Research Program (USGCRP), "Volume II: Impacts, Risks, and Adaptation in the United States," in *Fourth National Climate Assessment*, eds. D. R. Reidmiller, C. W. Avery, D. R. Easterling, et al. (Washington, D.C.: USGCRP, 2018), doi: 10.7930/NCA4.2018; and CRS Report R45086, *Evolving Assessments of Human and Natural Contributions to Climate Change*, by Jane A. Leggett.

[7] USGCRP, "Volume II: Impacts, Risks, and Adaptation in the United States," in *Fourth National Climate Assessment*, eds. D. R. Reidmiller, C. W. Avery, D. R. Easterling, et al. (Washington, D.C.: USGCRP, 2018), doi: 10.7930/NCA4.2018.

impacts of climate change in the United States and abroad are and would be modest and manageable.

A range of actions that seek to reduce GHG emissions are currently under way or being developed by international and subnational entities (e.g., financing by multilateral development banks, or U.S. state actions or regional partnerships), as well as by the U.S. federal government (e.g., support for carbon capture technologies). Nonetheless, Members of Congress and stakeholders have different viewpoints concerning what, if anything, to do about future climate change and related impacts. President Joseph Biden's Administration has increased the ambition[8] of U.S. GHG reduction targets and announced a whole-of-government approach to addressing climate change. In the legislative branch, numerous Members of Congress have expressed a range of perspectives regarding climate change issues. Some Members seeking to take action on climate change have proposed a variety of legislative approaches.

This report provides an overview of U.S. climate change policy as of September 2021. It begins with background on U.S. emission trends and a brief history of U.S. climate change policy, and discusses emissions mitigation activities at the subnational level, including state and regional programs. Next, the report discusses legislative developments, including recently enacted legislation related to climate change and legislative proposals in the 117th Congress. The report also considers executive branch actions and presents information about the Biden Administration's GHG targets, announced policies, proposals for legislative action, and examples of other policy actions. The report concludes with issues for Congress.

This report does not provide a comprehensive summary of these actions, given their breadth and continuously evolving nature. Rather, it aims to provide a snapshot of the current climate change policy landscape. Upcoming international discussions, strongly held public opinions, expected forthcoming scientific and economic reports, and other factors make it likely that climate change may continue to be a topic of deliberation and proposed actions in Congress. Moreover, developments may occur rapidly.

U.S. Emission Trends

The most recent U.S. GHG Inventory prepared by the U.S. Environmental Protection Agency (EPA) reports annual emissions and emission sinks from 1990 through 2019.[9] EPA's inventory includes gross and net emission levels.[10] As illustrated in **Figure 1**, the highest level of gross U.S. GHG emissions—15.6% above 1990 levels—occurred in 2007. Gross U.S. GHG emissions in 2019 were 6,558 million metric tons of carbon dioxide-equivalent emissions ($MMTCO_2e$),[11]

[8] *Ambition* with regard to GHG targets is a term used internationally with regard to the magnitude of limitations or reductions sought by countries or other actors.

[9] Emission sinks, such as forests, vegetation, and soils, remove CO_2 from the atmosphere and store the carbon. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

[10] *Gross emissions* refer to total emissions from all sources, and it does not account for net removals of CO_2 emissions from the atmosphere by vegetation and other sinks. U.S. sinks removed about 789 million metric tons (MMT) in 2019, about 12% of gross emissions. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019*, April 14, 2021, https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019. (Hereinafter, U.S. GHG Inventory, 1990-2019.)

[11] Million metric tons of CO_2 equivalent ($MMTCO_2e$) is used because GHGs vary by global warming potential (GWP). GWP is an index that allows comparisons of the heat-trapping ability of different gases over a period of time.

which is 1.8% higher than 1990 GHG emission levels and 11.6% below 2005 levels—the year the United States uses as a benchmark for its international GHG pledges.[12]

Figure 1 also shows the gross emissions contributions and trends by sector. The electricity sector historically accounted for the largest percentage of U.S. GHG emissions from fossil fuel combustion. As the figure indicates, emissions in the electricity sector decreased by 33% between 2005 and 2019. As the side-by-side comparison in **Figure 1** illustrates, the decrease in total U.S. GHG emissions over the past 15 years was largely related to decreases in the electricity sector. The evolving electricity generation portfolio played a key role in the emissions decrease in the electricity sector. Different fossil fuels, like coal and natural gas, generate different amounts of GHGs per unit of generated electricity. For example, a natural-gas unit typically yields about 40% of the GHG emissions of a coal-fired unit per megawatt-hour of electricity. Some sources of electricity generation, such as nuclear power, wind, and solar, emit no GHG emissions at the point of power generation. Over the past decade, coal's contribution to electricity generation decreased, while natural gas and renewable generation both increased. Several factors likely played a role in this change, including technological advances, particularly hydraulic fracturing, as well as federal tax incentives for renewable energy and renewable portfolio standards in the states. These and other factors have affected the relative price differences between sources of electricity, influencing their deployment in the electricity sector.[13]

Due to declines in the electricity sector emissions over the past decade, emissions from the transportation sector surpassed those from electricity in 2016.[14] In 2019, the transportation sector accounted for 29% of total U.S. GHG emissions, and the electricity and industrial sectors accounted for 25% and 23%, respectively.

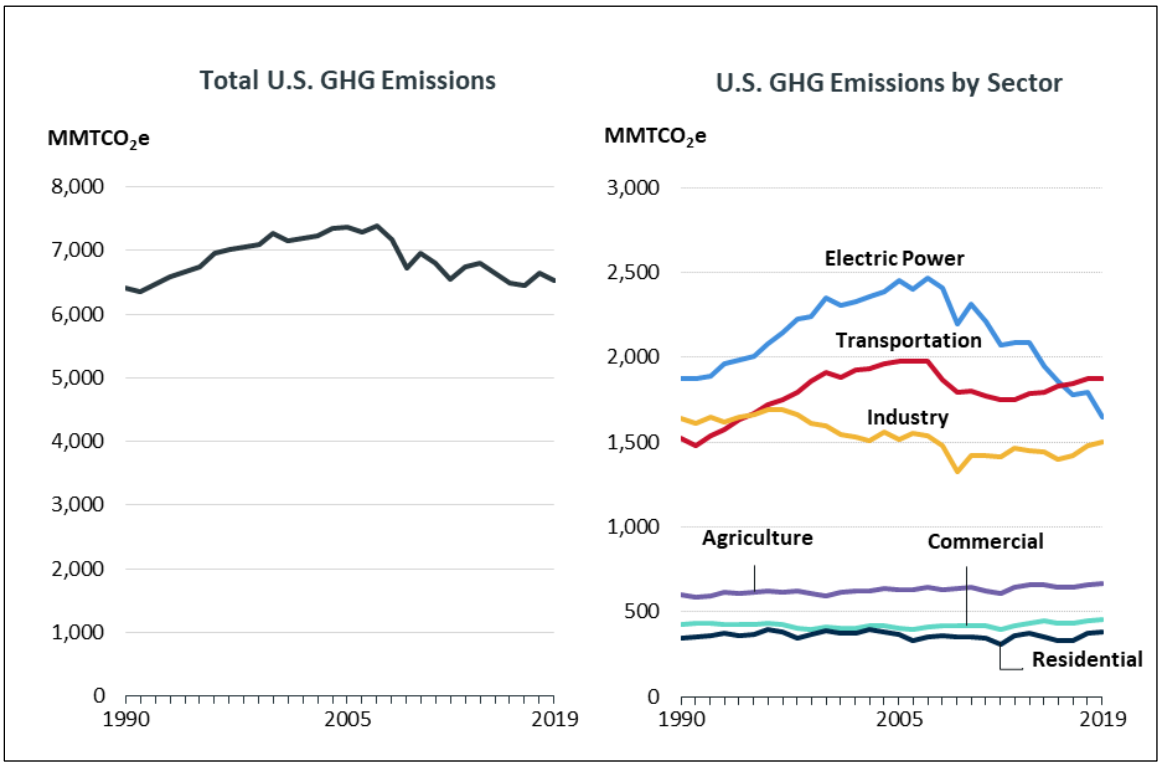
[12] U.S. GHG Inventory, 1990-2019.

[13] For more discussion, see CRS Report R45453, *U.S. Carbon Dioxide Emissions in the Electricity Sector: Factors, Trends, and Projections*, by Jonathan L. Ramseur.

[14] For more discussion, see CRS Report R45453, *U.S. Carbon Dioxide Emissions in the Electricity Sector: Factors, Trends, and Projections*, by Jonathan L. Ramseur.

Figure 1. U.S. GHG Emissions: 1990-2019

Total U.S. Emissions and Emissions by Sector



Source: Prepared by CRS; data from EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019*, April 14, 2021, https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019.

Notes: The scales of the y-axes in the above figures are different. The figure presents gross emissions (i.e., the total emissions from all sources), and it does not account for net removals of CO_2 emissions from the atmosphere by vegetation and other sinks. U.S. GHG emissions can be categorized in a variety of ways. This figure uses the economic sectors from EPA's Inventory. EPA's Inventory (Table 2-12) also presents emissions by economic sector, with the emissions from the electricity sector distributed to each sector based on the sector's electricity use.

History of U.S. Federal Climate Policy

The United States has historically demonstrated varying approaches and intent with regard to addressing climate change generally and to participating in GHG abatement under the 1992 United Nations Framework Convention on Climate Change (UNFCCC).[15] While the United States was instrumental in establishing the negotiations toward that treaty, it did not support binding GHG "targets and timetables" and financial assistance to lower-income countries to reduce their emissions and adapt to climate change. The UNFCCC did not contain binding targets.

[15] U.N. Treaty Collection, Chapter XXIII. The U.S. Senate's ratification of the UNFCCC in October 1992 was second among signatories and the first by an industrialized country. President George H. W. Bush transmitted the signed treaty to the Senate for its advice and consent in 138 *Congressional Record* 23902 (September 8, 1992). The U.S. Senate gave its advice and consent to ratification in 138 *Congressional Record* 33527 (October 7, 1992). See also S. Treaty Doc. 102-38 (1992); S. Exec. Rept. 102-55. President Bush signed the instrument of ratification and submitted it to the United Nations on October 13, 1992. Depositary notification C.N.148.1993.

Why "Net-Zero" Emissions Targets?

The UNFCCC stated an objective that effectively established a collective "net zero" GHG emissions commitment among parties to the agreement, with no specific target date. The UNFCCC objective is "to stabilize GHG concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system, in a time frame which allows ecosystems to adapt naturally and enables sustainable development." Stabilizing GHG concentrations in the atmosphere requires that the balance of "gross" emissions of GHG minus the removals of GHG from the atmosphere reach "net zero" in order to halt any accumulation of emissions in the atmosphere that leads to climate change. The date would be determined by a policy decision (i.e., balancing more considerations than science alone) on what constitutes "*dangerous* ... interference in the climate system." For more information, see CRS In Focus IF11821, *Net-Zero Emissions Pledges: Background and Recent Developments*, by Michael I. Westphal.

The 1997 Kyoto Protocol to the UNFCCC included binding GHG targets for the industrialized countries, including the United States, listed in its Annex I ("Annex I Parties"), but no new commitments for developing countries.[16] The United States signed but did not ratify this treaty. Following a stalemate in 2009 toward negotiation of a legal instrument that would include the United States, China, and other major emitting countries, the Barack Obama Administration led development of a more collaborative and bilateral relationship with China and others.[17] This more collaborative process resulted in adoption of the Paris Agreement (PA) in 2015.[18] President Obama accepted the agreement without submitting it to the Senate for advice and consent, and the United States became a Party to the agreement when the PA entered into force in 2016.[19] President Donald Trump announced U.S. withdrawal from the PA in June 2017, which, following the procedures of the treaty, became effective in November 2020. On President Biden's first day in office, he accepted the PA, and the United States again became a Party on February 19, 2021.

To date, U.S. climate change policy has involved actions—such as standards, investments, tax incentives, programs, and support for technology innovation—implemented under various legal authorities. Congress has previously deliberated comprehensive authority to address climate change, but votes on such legislation have been relatively rare. One example is H.R. 2454 in the 111th Congress, the American Clean Energy and Security Act of 2009 ("Waxman-Markey"), which would have established an economy-wide cap-and-trade system to reduce GHG emissions. The House passed H.R. 2454 in 2009. Although companion legislation in the Senate, S. 1733,

[16] United Nations Treaty Collection, *Chapter XXVII: Environment*, "7.a. Kyoto Protocol to the United Nations Framework Convention on Climate Change," December 12, 2015, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-a&chapter=27&clang=_en. The United States signed the Kyoto Protocol on November 12, 1998. However, in the "Byrd-Hagel" Resolution (S.Res. 98, 105th Congress, agreed to by a 95-0 vote), the Senate expressed its opposition by stating that the United States should not sign a treaty that (1) "would mandate new commitments to limit or reduce greenhouse gas emissions for the Annex I Parties, unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties," or (2) "would result in serious harm to the economy of the United States." The Kyoto Protocol was never submitted to the Senate for ratification. For background on international treaties, see CRS Report RL32528, *International Law and Agreements: Their Effect upon U.S. Law*, by Stephen P. Mulligan.

[17] For a historical perspective, see CRS In Focus IF10296, *New Climate Change Joint Announcement by China and the United States*, by Jane A. Leggett.

[18] United Nations Treaty Collection, *Chapter XXVII: Environment*, "7.d. Paris Agreement," December 12, 2015, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-a&chapter=27&clang=_en. U.S. depositary notification C.N.10.2021. See also CRS In Focus IF11746, *United States Rejoins the Paris Agreement on Climate Change: Options for Congress*, by Jane A. Leggett.

[19] Obama Administration officials concluded that the PA "does not require submission to the Senate because of the way it is structured. The targets are not binding; the elements that are binding are consistent with already approved previous agreements." See U.S. Department of State, "Background Briefing on the Paris Climate Agreement," December 12, 2015, https://2009-2017.state.gov/r/pa/prs/ps/2015/12/250592.htm.

was ordered reported from the Committee on Environment and Public Works, the bill was not brought to the Senate floor for consideration. In the absence of new comprehensive legislative authority to reduce GHGs, the Obama Administration pursued GHG emissions abatement under existing authorities.[20] State and local governments have also historically implemented a variety of climate change actions (see "Climate Mitigation Activities in U.S. States").

Mostly Voluntary or Indirect Federal Approaches Until 2010

From negotiation of the UNFCCC through the mid-2000s, the federal government primarily relied on "no regrets" programs to address climate change, along with some efficiency regulation that also limited GHGs.[21] The programs assisted agencies and nonfederal partners in achieving voluntary GHG reductions using technical assistance and reputational incentives offered by the EPA, the U.S. Department of Energy (DOE), and the U.S. Department of Agriculture (USDA). Examples include Energy Star, AgStar, and EPA's Center for Corporate Climate Leadership programs.[22] A number of studies, however, concluded that voluntary action alone could not substantially reduce GHG emissions.[23]

Several regulatory programs indirectly limited GHG emission increases from vehicles, appliances and equipment, and buildings. These continue, and largely have had increasing influence on reducing GHG emissions as standards tightened over time. For example, the Corporate Average Fuel Economy (CAFE) standards promulgated by the National Highway Traffic Safety Administration (NHTSA) set fuel economy targets, in miles per gallon, for newly manufactured passenger cars and light trucks sold in the United States. These standards have the co-benefit of reducing GHG emissions from these vehicles.

DOE's conservation and energy efficiency programs provide another example of standards that indirectly limit GHGs. Congress has enacted several broad energy policy laws—including support for energy conservation and energy efficiency—since the 1970s, most recently the Energy Act of 2020 (Division Z of P.L. 116-260). The Energy Policy and Conservation Act (EPCA; P.L. 94-163) authorized a federal program to establish minimum energy conservation standards for consumer products and industrial equipment, among other provisions. EPCA, as amended, authorizes DOE's Appliance and Equipment Standards Program, which sets efficiency standards for approximately 60 product categories.[24] The Energy Conservation and Production Act (ECPA; P.L. 94-385) established federal voluntary performance standards for new residential and commercial buildings and encouraged state and local governments to adopt and enforce

[20] White House, "Remarks by the President in the State of the Union Address," February 12, 2013.

[21] A *no regrets* approach generally refers to policies that would provide benefits, such as economic, human health, or environmental benefits, regardless of future climate change.

[22] See, for example, EPA, Voluntary Energy and Climate Programs, 2008, archived web page, 2017, at https://19january2017snapshot.epa.gov/climatechange/voluntary-energy-and-climate-programs_.html. See also EPA, Business Guide to EPA Climate Partnership Programs, https://archive.epa.gov/partners/web/pdf/biz_guide_to_epa_climate_partnerships.pdf.

[23] See, among other resources, Thomas P. Lyon and John W. Maxwell, "Environmental Public Voluntary Programs Reconsidered," *Policy Studies Journal*, vol. 35, no. 4 (2007): pp. 723-750, https://doi.org/10.1111/j.1541-0072.2007.00245.x; Richard D. Morgenstern and William A. Pizer, *Reality Check: The Nature and Performance of Voluntary Environmental Programs in the United States, Europe, and Japan* (Routledge, 2010); and Katie Southworth, "Corporate Voluntary Action: A Valuable but Incomplete Solution to Climate Change and Energy Security Challenges," *Policy and Society*, vol. 27, no. 4 (March 1, 2009), pp. 329-350, https://doi.org/10.1016/j.polsoc.2009.01.008.

[24] For more information, see CRS In Focus IF11354, *Department of Energy Appliance and Equipment Standards Program*, by Corrie E. Clark.

standards through building codes, among other provisions. ECPA, as amended, also established federal building energy efficiency standards.[25]

Congress established requirements for the federal government related to GHGs. The Energy Policy Act of 2005 (EPACT 2005; P.L. 109-58) established a renewable electricity goal for the federal government. The Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) required agencies to report GHG emissions, although it did not specify what types of emissions. EPACT 2005 also established the Renewable Fuel Standard (RFS), which mandates that U.S. transportation fuels contain a minimum volume of renewable fuel; EISA subsequently expanded the RFS mandate.[26] The RFS mandate requires that transportation fuels sold or introduced into commerce in the United States contain an increasing volume of a predetermined suite of renewable fuels.[27] In order to be eligible for the RFS, a renewable fuel has to meet a GHG emission reduction threshold, among other criteria. The statute required 4.0 billion gallons of renewable fuel in 2006, ascending to 36.0 billion gallons required in 2022, with EPA determining the volume amounts after 2022 in future rulemakings.[28]

After the mid-2000s, tax incentives and federal grants, including for research and development, increasingly supported renewable energy generation, biomass fuels, and lower-emission vehicles.[29] Administrations, over decades, have supported research to develop technologies, such as renewable energy systems, that could achieve deeper GHG reductions and reduce the cost of doing so. Increases in tax incentives for technology deployment, along with growing competition among manufacturers, led to increased efficiencies and reduced costs of many technologies, including wind and solar electricity generation.[30]

In late 2007, Congress directed EPA to establish a GHG reporting program. Specifically, the Consolidated Appropriations Act, 2008 (P.L. 110-161), provided $3.5 million for EPA to develop and publish a rule that would "require mandatory reporting of greenhouse gas emissions above appropriate thresholds in all sectors of the economy of the United States." In response to the congressional directive, EPA established the Greenhouse Gas Reporting Program (GHGRP). It requires reporting from facilities in nearly all categories of direct emitters and from suppliers of certain fuels and manufactured GHGs (e.g., fluorinated GHGs) in the United States. The broad scope of emissions data collected from these sources allows the agency to assess trends in emissions over time and within industry sectors for use in agency policy and programs. The

[25] Several laws have amended ECPA over the years. For more information on federal building energy requirements, see CRS Report R46719, *Green Building Overview and Issues*, by Corrie E. Clark.

[26] EPACT established RFS as an amendment to the Clean Air Act; see 42 U.S.C. §7545(o).

[27] For more information, see CRS Report R43325, *The Renewable Fuel Standard (RFS): An Overview*, by Kelsi Bracmort.

[28] EPA has the authority to waive the RFS requirements, in whole or in part, if certain conditions outlined in statute prevail. For more information, see CRS Report R44045, *The Renewable Fuel Standard (RFS): Waiver Authority and Modification of Volumes*, by Kelsi Bracmort.

[29] Most of the value of energy-related tax incentives supported fossil fuel until the mid-2000s, when the value of those supporting renewables increased. For more information, see CRS Report R44852, *The Value of Energy Tax Incentives for Different Types of Energy Resources*, by Molly F. Sherlock.

[30] For example, see Lazard, *Levelized Cost of Energy, Levelized Cost of Storage, and Levelized Cost of Hydrogen*, October 18, 2020, https://www.lazard.com/perspective/lcoe2020. In addition, there have been tax credits for alternative fuel vehicles, such as hybrids, and more recently for plug-in electric vehicles. For more information, see CRS In Focus IF11017, *The Plug-In Electric Vehicle Tax Credit*, by Molly F. Sherlock.

GHGRP does not impose emissions limits, but reporting programs may create transparency incentives for sources to limit their emissions due to public or reputational pressures.[31]

Federal Regulation of GHGs Under Existing Authorities, 2010 to 2021

A shift toward direct federal regulation of GHG emissions occurred following the 2007 decision in *Massachusetts v. EPA*, in which the Supreme Court found that EPA has authority to regulate GHG emissions from motor vehicles as air pollutants under the Clean Air Act (CAA).[32] In the 5-4 decision, the Court's majority concluded that EPA must decide whether GHG emissions from new motor vehicles contribute to air pollution that may reasonably be anticipated to endanger public health or welfare—or provide a reasonable explanation why it cannot or will not make that decision. On December 15, 2009, EPA promulgated findings that six GHGs[33] endanger both public health and welfare and that GHG emissions from new motor vehicles contribute to that endangerment. These findings are collectively referred to as the "endangerment finding."

Of the six GHGs discussed in EPA's endangerment finding, CO_2 is the most prevalent, accounting for about 80% of U.S. GHG emissions, on a CO_2-equivalent basis, from human activities in 2019.[34] The second-most-prevalent gas in the United States in terms of emissions is methane (10% of U.S. GHG emissions in 2019), followed by nitrous oxide (7% in 2019).[35] In 2019, about two-thirds of domestic CO_2 emissions were produced by the combustion of fossil fuels for energy and transportation.[36] The primary sources of U.S. methane emissions include oil and natural gas systems, agriculture, and landfills,[37] and the primary source of nitrous oxide emissions is agricultural soil management.[38]

The endangerment finding triggered EPA's duty under CAA Section 202(a) to promulgate emission standards for new motor vehicles, which are discussed below.[39] EPA has also since issued rules to limit GHGs under other CAA authorities. For example, the agency promulgated regulations under CAA Section 111 to limit GHGs from the electricity sector, the oil and gas

[31] CRS In Focus IF11754, *EPA's Greenhouse Gas Reporting Program*, by Angela C. Jones.

[32] 549 U.S. 497 (2007). The Court held that GHGs are air pollutants within the Clean Air Act's (CAA's) definition of that term and that EPA must regulate their emissions from motor vehicles if the agency finds that such emissions cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare. See CRS Report R43699, *Key Historical Court Decisions Shaping EPA's Program Under the Clean Air Act*, by Linda Tsang. The Clean Air Act is codified as 42 U.S.C. 7401 et seq.

[33] The six GHGs are CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

[34] U.S. GHG Inventory, 1990-2019.

[35] Prevalence reported on a CO_2-equivalent basis. U.S. GHG Inventory, 1990-2019.

[36] EPA attributed 35% of U.S. CO_2 emissions to transportation and 31% to electricity. U.S. GHG Inventory, 1990-2019. See also EPA, *Overview of Greenhouse Gases*, https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

[37] Two agricultural sources of methane are livestock (e.g., some animals produce methane through the digestive process, known as enteric fermentation) and management of animal manure. EPA attributed 27% of methane emissions in 2019 to enteric fermentation and 9% to manure management. EPA also estimated that 30% of methane emissions were produced by oil and natural gas systems in 2019, and 17% by landfills in 2019. U.S. GHG Inventory, 1990-2019. See also EPA, *Overview of Greenhouse Gases*, https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

[38] EPA reported that agricultural soil management (e.g., application of fertilizers, manure management, or burning of agricultural residues) accounted for 75% of domestic nitrous oxide emissions in 2019. U.S. GHG Inventory, 1990-2019. See also EPA, *Overview of Greenhouse Gases*, https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

[39] EPA, "Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule," 74 *Federal Register* 66496, December 15, 2009.

industry, and municipal solid waste landfills. EPA also finalized, in consultation with the Federal Aviation Administration, CO_2 emission standards for civilian aircraft under CAA Section 231 in January 2021.[40] EPA developed the aircraft standards in line with the internationally negotiated standards agreed to by parties to the International Civil Aviation Organization.

The remainder of this section discusses GHG rules for vehicles, power plants, oil and natural gas systems, and municipal solid waste landfills that were promulgated prior to the Biden Administration.

Vehicle Fuel Economy and GHG Standards

As noted previously, transportation emissions are currently the largest source of GHG emissions in the United States.[41] In 2010, the Obama Administration brokered an agreement among 13 auto manufacturers, the State of California,[42] the United Auto Workers union, and other interested parties for GHG emission standards for automobiles and light trucks. EPA promulgated these GHG standards, which aligned with NHTSA's CAFE program, as well as with those developed by California to facilitate a "single national standard" for manufacturers.[43] EPA and NHTSA also promulgated two phases of fuel efficiency and GHG standards for newly manufactured heavy-duty vehicles and engines (e.g., long-haul tractor-trailers, buses, and construction and utility vehicles).[44]

In 2020, EPA and NHTSA promulgated the SAFE Vehicles Rule, which relaxed the GHG and fuel economy standards for light-duty vehicles.[45] EPA also withdrew the waiver that had allowed California to set GHG emission standards stronger than the national standards to meet "compelling and extraordinary conditions," as authorized under the CAA.[46] Various states, local governments, and environmental and consumer organizations filed petitions for review in the U.S. Court of Appeals for the D.C. Circuit challenging the SAFE Vehicles Rule.

[40] EPA, "Control of Air Pollution From Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures," 86 *Federal Register* 2136, January 11, 2021. For background, see CRS In Focus IF11696, *Aviation and Climate Change*, by Richard K. Lattanzio.

[41] U.S. GHG Inventory, 1990-2019.

[42] The Energy Policy and Conservation Act of 1975, as amended, and the CAA, as amended, generally preempt states from adopting their own fuel economy and emission standards for new motor vehicles. However, CAA Section 209(b) allows the State of California to request a preemption waiver for its vehicle emission standards provided that they are at least as stringent as federal standards and, among other things, are necessary to meet "compelling and extraordinary conditions." For this reason, California has typically been involved in all federal vehicle emissions rulemakings.

[43] For model years 2012-2016, see EPA and NHTSA, "Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Final Rule," 75 *Federal Register* 25323, May 7, 2010. For model years 2017 and later, see EPA and NHTSA, "2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Final Rule," 77 *Federal Register* 62624, October 15, 2012.

[44] Phase 1 rule: EPA and NHTSA, "Greenhouse Gas Emissions Standards and Fuel-Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles," 76 *Federal Register* 57106, September 15, 2011. Phase 2 rule: EPA and NHTSA, "Greenhouse Gas Emissions Standards and Fuel-Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2," 81 *Federal Register* 73478, October 25, 2016.

[45] EPA and NHTSA, "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks," 85 *Federal Register* 24174, April 30, 2020.

[46] EPA and NHTSA, "The Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule, Part One: One National Program," 84 *Federal Register* 51310, September 27, 2019. See also CRS In Focus IF10871, *Vehicle Fuel Economy and Greenhouse Gas Standards*, by Richard K. Lattanzio, Linda Tsang, and Bill Canis.

Power Plants and GHG Standards

To limit CO_2 from the electricity sector, currently the second-largest emitting source category in the United States,[47] EPA in 2015 promulgated New Source Performance Standards (NSPS) for new and modified fossil-fuel-fired power plants[48] and—for existing plants—the Clean Power Plan (CPP).[49] The CPP was the subject of ongoing litigation and was never implemented. While the NSPS remain in place, the Trump Administration repealed the CPP and finalized a new rule, the Affordable Clean Energy (ACE) rule, to limit CO_2 from existing power plants. The ACE rule applied a narrower interpretation than the CPP of the "best system of emission reduction," defining it as on-site "heat rate improvement" measures, also known as efficiency improvements, for existing coal-fired units.[50] In January 2021, a federal appellate court vacated and remanded the ACE rule to EPA, and it remains unclear how EPA may act on the rule.[51] The CPP and ACE rules, issued under separate Administrations, relied on different interpretations of EPA's CAA authority, which may raise questions about EPA's potential approach to regulating GHG emissions under the CAA.

Although federal requirements to limit GHG emissions in the electricity sector have not been implemented,[52] GHG emissions in the sector declined by 33% between 2005 and 2019, as discussed earlier in this report. See "U.S. Emission Trends" and **Figure 1**.

Oil and Natural Gas Systems, Solid Waste Landfills, and GHG Standards

Under the Obama Administration, federal activities in support of GHG emissions reductions in various industrial sectors became a cornerstone of President Obama's "Climate Action Plan." The Administration promulgated several regulations to address these emissions, including

- EPA standards to reduce methane emissions from new and modified activities and equipment in the oil and natural gas sector (finalized on June 3, 2016);[53]
- EPA standards to reduce methane emissions from new and existing municipal solid waste landfills (finalized on August 29, 2016);[54] and

[47] U.S. GHG Inventory, 1990-2019.

[48] EPA, "Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units," Final Rule, 80 *Federal Register* 64509, October 23, 2015.

[49] EPA, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Final Rule," 80 *Federal Register* 64661, October 23, 2015.

[50] CRS Report R46568, *EPA's Affordable Clean Energy Rule: In Brief*, coordinated by Kate C. Shouse.

[51] The court directed EPA to reconsider its interpretation of its CAA Section 111(d) authority to regulate GHGs from existing power plants. The court also vacated the CPP repeal but stayed its mandate until the EPA responds to the court's remand in a new rulemaking action.

[52] Under the ACE rule, states were to establish performance standards for designated facilities through state plans. A federal appellate court vacated and remanded the ACE rule to EPA before the date—July 8, 2022—that state plans were due to EPA.

[53] EPA, "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources," 81 *Federal Register* 35824, June 3, 2016.

[54] For new landfills, see EPA, "Standards of Performance for Municipal Solid Waste Landfills," 81 *Federal Register* 59332, August 29, 2016. For existing landfills, see EPA, "Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills," 81 *Federal Register* 59276, August 29, 2016.

- Bureau of Land Management (BLM) standards to prevent the waste of gas (i.e., methane) through venting and flaring during oil and natural gas production on public lands (finalized on November 18, 2016).[55]

President Trump subsequently signed Executive Order 13783 on March 28, 2017, requiring agencies to review existing regulations and "appropriately suspend, revise, or rescind those that unduly burden" domestic energy production and use. Further, the federal courts reviewed provisions in the Obama-era standards and the Trump Administration's revisions. As a result, the status of federal methane regulation was as follows by the end of the Trump Administration:

- EPA rescinded the 2016 methane standards for the oil and gas sector (September 14, 2020).[56] (See also "Recently Enacted Legislation Related to GHGs" for related legislative action undertaken in 2021, in particular, S.J.Res. 14 and P.L. 117-23, which disapproved the 2020 policy revisions of EPA's 2016 methane standards for the oil and natural gas sector. Although most of the requirements under EPA's 2016 rule are back in force, their fate remains unclear because of pending legislative, executive, and judicial actions.[57])
- The 2016 methane standards for new and existing municipal solid waste landfills remain in effect.[58] Stakeholders have challenged the 2016 methane standards for existing landfills in court, but the litigation is on hold.[59]
- BLM rescinded the 2016 waste prevention standards for the oil and gas sector (September 28, 2018). A California federal district court vacated the rescission (July 15, 2020);[60] however, a Wyoming federal district court subsequently vacated all provisions in the 2016 rule related to the loss of gas (October 8, 2020).[61] Appellate litigation is ongoing.[62]

Climate Mitigation Activities in U.S. States

In the absence of comprehensive federal controls on GHG emissions, state and local governments have taken a variety of actions—both legal mandates and voluntary efforts—for nearly 20 years. Generally, these efforts include emission controls on power plants and vehicles; building codes;

[55] Bureau of Land Management, "Waste Prevention, Production Subject to Royalties, and Resource Conservation," 81 *Federal Register* 83008, November 18, 2016.

[56] EPA, "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," 85 *Federal Register* 57018, September 14, 2020.

[57] For more information, see CRS Legal Sidebar LSB10622, *Looking Ahead: Regulating Methane from the Oil and Natural Gas Sector*, by Linda Tsang.

[58] Since 2016, EPA has taken actions related to the timing and implementation of the landfill methane standards. However, on April 5, 2021, the D.C. Circuit granted EPA's request to vacate and remand the 2019 rule, which had extended the timing for state plan requirements for existing landfills. Environmental Def. Fund v. EPA, No. 19-1222 (D.C. Cir. April 5, 2021). In 2021, EPA finalized federal plan requirements to implement the standards for existing landfills; see EPA, "Federal Plan Requirements for Municipal Solid Waste Landfills That Commenced Construction On or Before July 17, 2014, and Have Not Been Modified or Reconstructed Since July 14, 2014," 86 *Federal Register* 27756, May 21, 2021.

[59] Order, National Waste & Recycling Ass'n v. EPA, No. 16-1371 (D.C. Cir. April 17, 2018). See also CRS Report R44615, *EPA's Methane Regulations: Legal Overview*, by Linda Tsang.

[60] California v. Bernhardt, 472 F. Supp. 3d 573 (N.D. Cal. 2020).

[61] Wyoming v. U.S. Dep't of the Interior, 493 F. Supp. 3d 1046 (D. Wyo. 2020).

[62] Congressional clients may contact Linda Tsang, CRS Legislative Attorney, for more information.

and other actions. In particular, a number of U.S. states have mandatory GHG reduction programs, including the following:

- California has a GHG emissions cap-and-trade program that went into effect in 2013 that applies to electric power, selected industries, and fossil fuel distributors.[63] The program is linked with a cap-and-trade program in the Canadian province of Quebec. The program is a key component of the state's plan to meet its legislated target of reducing GHG emissions 40% below 1990 levels by 2030.[64]
- Eleven U.S. states participate in the Regional Greenhouse Gas Initiative (RGGI),[65] a cap-and-trade program on CO_2 emissions from electric power that went into effect in 2009. The RGGI states have revised their program over time. The most recent revision aims to reduce power-sector emissions in the 11 states to 30% below 2020 levels by 2030.[66]
- Thirty states, three U.S. territories, and the District of Columbia have mandatory electricity portfolio standards (clean energy standards or renewable portfolio standards), which require a minimum amount of electricity be generated by eligible sources such as renewables. Of these, 11 jurisdictions are to ultimately require 100% of electricity to come from eligible clean sources.[67]
- Regarding vehicle emissions, California set standards in 2009, jointly with the federal government, to increase fuel efficiency and reduce GHG emissions from many types of on-road vehicles.[68] California also set standards to require auto manufacturers to increase the number of zero emission vehicles (ZEVs) sold in the state.[69] Fourteen other states and the District of Columbia adopted California's vehicle standards.[70] California's authority to set these standards under the CAA was preempted by the Trump Administration, but related

[63] For more information, see the California Air Resources Board website, https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program.

[64] See California Senate Bill 32 (signed September 8, 2016); for a discussion of how the state intends to meet these goals, see California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf.

[65] The Regional Greenhouse Gas Initiative (RGGI) states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Virginia, and Vermont. Through executive branch action, Pennsylvania is seeking to join RGGI. Some policymakers in Pennsylvania's legislative bodies have voiced strong opposition to joining RGGI and the governor's actions to join the program without enacting new legislation.

[66] See RGGI 2016 program review materials, https://www.rggi.org/program-overview-and-design/design-archive/2016-materials.

[67] The 11 jurisdictions with 100% clean energy standards are California, Colorado, the District of Columbia, Hawaii, Massachusetts, New Mexico, New York, Oregon, Puerto Rico, Virginia, and Washington. For additional information, see CRS Report R46691, *Clean Energy Standards: Selected Issues for the 117th Congress*, by Ashley J. Lawson.

[68] California Air Resources Board, "Low Emissions Vehicle Program," https://ww2.arb.ca.gov/our-work/programs/low-emission-vehicle-program.

[69] California Air Resources Board, "Zero-Emission Vehicle Program," https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program.

[70] The CAA allows other states to adopt California's motor vehicle emission standards under certain conditions (42 U.S.C. §7507). Section 177 requires, among other things, that such standards be identical to the California standards for which a waiver has been granted. States are not required to seek EPA approval under the terms of Section 177. Fourteen other states and the District of Columbia have adopted California's GHG standards under these provisions: Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, Washington, and the District of Columbia.

litigation paused in February 2021 so the incoming Biden Administration could review and potentially revise the rule. Additionally, 45 states and the District of Columbia provide incentives for electric vehicles and/or hybrids. The incentives range from tax credits or rebates to fleet acquisition goals, exemptions from emissions testing, or favorable electricity rate treatment.[71] Further, seven states have some version of a low carbon fuel standard or alternative fuel standard.[72] Additionally, 13 Northeast and Mid-Atlantic states plus the District of Columbia have sought policies to reduce carbon emissions from the transportation sector, and are seeking to use a policy modeled on RGGI and coordinated through the Transportation and Climate Initiative.[73]

When President Trump announced in June 2017 his intention to withdraw the United States from the PA, some U.S. mayors, county executives, governors, tribal leaders, college and university leaders, businesses, faith groups, and investors formed the We Are Still In organization to pledge and demonstrate nonfederal climate change actions to the international community.[74] In addition, the U.S. Climate Alliance, which includes governors from 24 states and Puerto Rico, announced a commitment to reduce net GHG emissions from their states at least 50%-52% below 2005 levels by 2030 and to achieve net-zero GHG emissions no later than 2050.[75] The degree to which state and local governments can achieve these targets without federal action is uncertain, as the legal authorities and jurisdictions over GHG emissions sources may be limited in some cases.

U.S. Legislative Action

Members of Congress have historically expressed a range of perspectives regarding climate change issues and have proposed a variety of legislative approaches. Legislative proposals have included

- carbon pricing frameworks (e.g., carbon taxes or cap-and-trade programs)[76] that would address a majority of U.S. GHG emissions;
- sectoral approaches, such as a clean energy standard;
- funding or tax policies that support GHG-abating technology development and deployment;
- efforts to increase adaptation to climate change; and
- international cooperation.

[71] For more detail, see National Conference of State Legislatures, "State Policies Promoting Hybrid and Electric Vehicles," https://www.ncsl.org/research/energy/state-electric-vehicle-incentives-state-chart.aspx.

[72] California and Oregon have low carbon fuel standards; Louisiana, Minnesota, Missouri, Oregon, Pennsylvania, and Washington have alternative fuel standards. For a summary, see Center for Climate and Energy Solutions, "Low Carbon and Alternative Fuel Standard," https://www.c2es.org/document/low-carbon-fuel-standard/.

[73] For more information, see Transportation and Climate Initiative, https://www.transportationandclimate.org/.

[74] "We Are Still In," accessed April 11, 2021, https://www.wearestillin.com/about. In 2021, We Are Still In joined America's Pledge and formed a new coalition, America Is All In; see https://www.americaisallin.com/about/.

[75] United States Climate Alliance, "U.S. Climate Alliance Commits to Achieve Net-Zero Emissions No Later than 2050," https://www.usclimatealliance.org/publications/newtargets.

[76] For background on carbon pricing, see CRS Report R45625, *Attaching a Price to Greenhouse Gas Emissions with a Carbon Tax or Emissions Fee: Considerations and Potential Impacts*, by Jonathan L. Ramseur and Jane A. Leggett.

On the other hand, some Members have introduced resolutions expressing that the multisector carbon pricing approaches are not in the economic interests of the United States.[77]

Votes on comprehensive climate change proposals have been relatively rare in either chamber of Congress, although votes on proposals that may indirectly address climate change have been more common. For example, Congress has repeatedly enacted legislation with tax incentives for renewable energy and carbon capture and sequestration efforts.[78]

Recently Enacted Legislation Related to GHGs

The Consolidated Appropriations Act, 2021 (P.L. 116-260), contained measures relevant to reducing GHG emissions, including the Energy Act of 2020 (Division Z) and the American Innovation and Manufacturing (AIM) Act of 2020 (Division S, §103). The Energy Act of 2020 promotes increased energy efficiency in homes, schools, and federal buildings; expands research and development in nuclear energy, energy storage, electric vehicles, renewable energy, and carbon capture utilization and storage (CCUS); and promotes energy storage development, among other provisions.[79]

The AIM Act of 2020 establishes a 15-year timeline to reduce domestic hydrofluorocarbons (HFCs), a potent class of GHGs used in air conditioning and refrigeration equipment, and directs the EPA to implement the requirements, including through regulations. AIM's phasedown schedule appears to align with international commitments to phase down HFCs under the Kigali Amendment to the Montreal Protocol to the 1985 Vienna Convention for the Protection of the Ozone Layer.[80] EPA has begun developing a program to phase down HFCs under AIM Act authorities.[81]

The 117th Congress passed, and President Biden signed into law, S.J.Res. 14 (P.L. 117-23), on June 30, 2021, disapproving of the Trump Administration's 2020 policy revisions of EPA's 2016 methane standards for the oil and natural gas sector. Although most of the requirements under EPA's rule are back in force, their fate remains unclear because of pending legislative, executive, and judicial actions.[82]

Legislative Proposals in the 117th Congress

Majority leadership in both the House and the Senate in the 117th Congress have called for whole-of-chamber approaches to addressing climate change.[83] Members have introduced many

[77] For example, see H.Con.Res. 41 in the 116th Congress and S.Res. 472 in the 114th Congress.

[78] For more information, see CRS Report R46865, *Energy Tax Provisions: Overview and Budgetary Cost*, by Molly F. Sherlock; and CRS Report R44902, *Carbon Capture and Sequestration (CCS) in the United States*, by Peter Folger.

[79] For more information, see CRS Report R46723, *U.S. Energy in the 21st Century: A Primer*, coordinated by Melissa N. Diaz.

[80] The United States is a Party to the Montreal Protocol (MP). As of September 2021, the United States is not a Party to the Kigali Amendment. For more information, see CRS In Focus IF11779, *Hydrofluorocarbon Phasedown: Issues for Congress*, by Kate C. Shouse.

[81] For example, see EPA, "Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program under the American Innovation and Manufacturing Act," 86 *Federal Register* 55116, October 5, 2021.

[82] For more information, see CRS Legal Sidebar LSB10622, *Looking Ahead: Regulating Methane from the Oil and Natural Gas Sector*, by Linda Tsang.

[83] See, for example, Speaker Nancy Pelosi, "Pelosi Remarks at Press Event Introducing H.R. 9, Climate Action Now Act," March 27, 2019, https://www.speaker.gov/newsroom/32719; and Senate Democrats, "Majority Leader Schumer Floor Remarks Providing An Update On The Senate Organizing Resolution And Instructing All Relevant Committees

proposals that address climate change in some capacity, and climate change legislation has been referred to more than 35 committees.

Among these proposals is legislation intended to modernize U.S. infrastructure and fund initiatives that may also increase climate resilience or reduce GHGs. In June 2021, a group of Senators reached agreement with President Biden on the "Bipartisan Infrastructure Framework" (BIF), a $1.2 trillion plan that would authorize $579 billion in new spending on transportation infrastructure, power infrastructure, climate resiliency, and other initiatives.[84] The BIF served as the basis for the Infrastructure Investment and Jobs Act (IIJA), a substitute amendment (S.Amdt. 2137) to H.R. 3684, which the Senate passed on August 10, 2021. IIJA is both an authorizing bill and an appropriations bill,[85] and it would authorize funds for federal-aid highways, highway safety programs, water and electricity infrastructure, broadband, and other initiatives. IIJA would also provide funds intended to promote, among other things, clean energy and increased resilience of U.S. infrastructure, such as schools and ports. For example, IIJA would authorize funds for a Port Infrastructure Development Program, which would include projects "that improve the resiliency of ports to address sea-level rise, flooding, extreme weather events, earthquakes, and tsunami inundation, as well as projects that reduce or eliminate port-related criteria pollutant or greenhouse gas emission."[86] As of September 2021, the House had not considered IIJA.

Congress has also considered climate change spending through its work on FY2022 budget reconciliation. Both chambers agreed to a $3.5 trillion budget resolution, S.Con.Res. 14, which established the congressional budget for FY2022, set budgetary levels for FY2023-FY2031, and provided reconciliation instructions to committees in the House and Senate.[87] Among other things, S.Con.Res. 14 sought to authorize spending that would support the President's goals of "80 percent clean electricity and 50 percent economy-wide carbon emissions reductions by 2030."[88] It set a September 15, 2021, deadline for House and Senate committees to submit legislative language to their respective Budget Committees for the reconciliation package. The House Budget Committee combined the House committee markups into one bill, H.R. 5376,

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To Hold Hearings On The Climate Crisis In Preparation For Enacting President Biden's Build Back Better Agenda | Senate Democratic Leadership," February 3, 2021, https://www.democrats.senate.gov/news/press-releases/majority-leader-schumer-floor-remarks-providing-an-update-on-the-senate-organizing-resolution-and-instructing-all-relevant-committees-to-hold-hearings-on-the-climate-crisis-in-preparation-for-enacting-president-bidens-build-back-better-agenda.

[84] Sen. Mitt Romney, "Senators' Joint Statement and Framework on Bipartisan Infrastructure Deal," press release, June 24, 2021, https://www.romney.senate.gov/senators-joint-statement-framework-bipartisan-infrastructure-deal. See also Sen. Mark R. Warner, "Warner, President Biden & Senate Colleagues Announce Bipartisan Agreement on Infrastructure," press release, June 24, 2021, https://www.warner.senate.gov/public/index.cfm/2021/6/warner-president-biden-senate-colleagues-announce-bipartisan-agreement-on-infrastructure.

[85] Congress has established a process that provides for two separate types of measures—authorization measures and appropriation measures. These measures perform different functions. Authorization acts establish, continue, or modify agencies or programs. An authorization act may also explicitly authorize subsequent appropriations for specific agencies and programs, frequently setting spending ceilings for them. See CRS Report R42388, *The Congressional Appropriations Process: An Introduction*, coordinated by James V. Saturno.

[86] IIJA, Division J, Title VIII, "Transportation, Housing and Urban Development, and Related Agencies"; see "Maritime Administration."

[87] S.Con.Res. 14, "A concurrent resolution setting forth the congressional budget for the United States Government for fiscal year 2022 and setting forth the appropriate budgetary levels for fiscal years 2023 through 2031." The Senate agreed to S.Con.Res. 14 on August 11, 2021. The House adopted S.Con.Res. 14 on August 24, 2021. For more information, see CRS Report R46893, *S.Con.Res. 14: The Budget Resolution for FY2022*, by Megan S. Lynch.

[88] U.S. Congress, Senate Committee on the Budget, *Concurrent Resolution on the Budget Fiscal Year 2022*, committee print, prepared by Committee on the Budget, 117th Cong., August 2021, S. Prt. 117-16, p. 7.

which is also referred to as "The Build Back Better Act." H.R. 5376 would provide funding, establish programs, and modify various "provisions relating to a broad array of areas, including education, labor, child care, health care, taxes, immigration, and the environment." Among other things, the bill would provide funding for energy efficiency and weatherization projects; electric vehicles and zero-emission, heavy-duty vehicles; and transit services and "clean energy projects" in low-income communities. It also includes provisions for a methane fee for certain oil and natural gas facilities. As of September 27, 2021, the House Budget Committee approved H.R. 5376 and reported it to the House of Representatives.

Members of Congress have also introduced many other proposals addressing climate change in the 117th Congress. CRS identified over 750 bills in Congress.gov that address climate change in some capacity in the 117th Congress, as of September 27, 2021.[89] CRS searched for bills by identifying climate-related key words in five broad categories: equity; land use; energy (including electricity, transportation, and energy efficiency); adaptation; and finance. These categories are summarized below.[90] The categories are not mutually exclusive, given that many bills contain provisions that fall under more than one category. In particular, CRS identified seven bills, listed below, that appeared in all of the five broad categories, indicating that these bills span a potentially wide range of climate change topics. (See **Appendix A** for details about the search methodology.)

- S. 283, "National Climate Bank Act," sponsored by Senator Markey, and referred to the Senate Committee on Environment and Public Works. Latest action: Hearings held by Senate Committee on Environment and Public Works, Subcommittee on Clean Air, Climate, and Nuclear Safety (April 27, 2021).
- S. 685, "America's Clean Future Fund Act," sponsored by Senator Durbin. Latest action: Read twice and referred to the Committee on Finance (March 10, 2021).
- S. 1201, "United States Climate Leadership in International Mitigation, Adaptation, and Technology Enhancement Act of 2021," sponsored by Senator Menendez. Latest action: Read twice and referred to the Committee on Foreign Relations (April 19, 2021).
- H.R. 1512, "Climate Leadership and Environmental Action for our Nation's Future Act," or CLEAN Future Act, sponsored by Representative Pallone. Latest action: Referred to multiple House committees and subcommittees (March 3, 2021).[91]
- H.R. 1848, "Leading Infrastructure For Tomorrow's America Act," or "LIFT America Act," sponsored by Representative Pallone. Latest action: Referred to

[89] Of the over 750 bills identified, 616 were introduced by Democrats, 9 by Independents, and 159 by Republicans; these numbers refer to primary sponsors and do not reflect cosponsors.

[90] CRS searched Congress.gov using a number of terms associated with climate change—including terms related to emissions reduction, adaptation, and equity, among others. For detailed search information, congressional clients may contact CRS Senior Research Librarian Kezee Procita.

[91] Referred to the Committee on Energy and Commerce, and in addition to the Committees on Transportation and Infrastructure; Oversight and Reform; Education and Labor; Ways and Means; Natural Resources; Armed Services; Foreign Affairs; Science, Space, and Technology; Intelligence (Permanent Select); and Financial Services, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned. For more details, see https://www.congress.gov/bill/117th-congress/house-bill/1512/all-actions.

five subcommittees of the House Transportation and Infrastructure Committee (March 12, 2021).[92]

- H.R. 4309, "Clean Energy Innovation and Deployment Act of 2021," sponsored by Representative DeGette. Latest action: Referred to the Subcommittee on Railroads, Pipelines, and Hazardous Materials of the House Committee on Transportation and Infrastructure (July 2, 2021).
- H.R. 4350, "National Defense Authorization Act for Fiscal Year 2022," sponsored by Representative Smith. Latest action as of the end of September: The Clerk was authorized to correct section numbers, punctuation, and cross references, and to make other necessary technical and conforming corrections in the engrossment of H.R. 4350 (September 23, 2021).

Thirty-four of the more than 750 legislative proposals that CRS identified received floor consideration, as of September 27, 2021.[93] Many of these bills fit into multiple broad topic categories. Also, some bills may contain only small provisions addressing climate change, while others are solely focused on a particular climate change topic in one or more of the five categories. Two of these bills (H.R. 3684 and H.R. 4350) fell into all five categories. Twenty-seven of the 34 fell into the energy category, and 18 of the 34 fell into the adaptation category. The remainder of this section briefly describes each category and presents the status of proposals that have at least received floor consideration as of September 27, 2021. **Table A-1** in **Appendix A** also provides a complete list of the bills that have at least received floor consideration.

Additional CRS reports examine certain legislative approaches under consideration by some in the 117th Congress and prior Congresses:

- CRS Report R45472, *Market-Based Greenhouse Gas Emission Reduction Legislation: 108th Through 117th Congresses*, by Jonathan L. Ramseur.
- CRS Report R46691, *Clean Energy Standards: Selected Issues for the 117th Congress*, by Ashley J. Lawson.

Adaptation

As of September 27, 2021, CRS identified 197 bills introduced in the 117th Congress that seek to address adaptation in some capacity.[94] This category includes proposals to address natural

[92] Subcommittees are as follows: Water Resources and Environment; Coast Guard and Maritime Transportation; Highways and Transit; Economic Development, Public Buildings, and Emergency Management; and Aviation. For more details, including list of other House Committees to which the bill was referred, see https://www.congress.gov/bill/117th-congress/house-bill/1848/all-actions.

[93] *Floor consideration* includes House and Senate bills that have received consideration on the floor of either chamber including taking up, amending, debate, voting, passage, amendments between chambers, and conference actions. This bill status does not include actions taken in committees. For more information, see https://www.congress.gov/help/action-search-scope-notes.

[94] Scientific and programmatic literature defines *adaptation* in various ways. In addition, CRS has observed a general shift from a prevalence in federal use of the term *climate change adaptation* to a rise in the term *resilience* in the context of climate change. *Adaptation* often implies altering a system to accommodate persistent or long-term anticipated changes in the climate; this may involve system alterations that may not be necessary to enhance resilience to a static climate condition. *Resilience* is sometimes (but not always) considered as withstanding a hazard with a return to predisturbance conditions, or "bouncing back." For more information, see CRS In Focus IF11827, *Climate Change: Defining Adaptation and Resilience, with Implications for Policy*, by Jane A. Leggett.

disasters, extreme weather events, coastal resilience, sea level rise, and more. Eighteen of these 197 bills received at least floor consideration.

Energy

As of September 27, 2021, CRS identified 682 bills introduced in the 117th Congress that seek to address energy issues related to climate change. These bills represent the majority of the bills identified in all of the searches. For the purposes of this research, CRS defined energy broadly to include GHG emissions mitigation efforts in the electricity generation, residential and commercial, and transportation sectors. Examples of mitigation efforts include renewable energy incentives, energy efficiency incentives, methane emission reduction efforts, and proposals to alter fossil fuel production practices, among others. Bills in this category propose a wide range of policy options, including carbon pricing, tax incentives, grants, R&D, and others. Twenty-seven of these 682 bills received at least floor consideration. Of these, H.R. 1319 became law (The American Rescue Plan Act of 2021, P.L. 117-2).[95]

Equity

As of September 27, 2021, CRS identified 104 bills introduced in the 117th Congress that seek to address equity issues related to climate change.[96] Bills identified in this search may include either an international or a domestic focus, or both. These bills include provisions to address issues such as community resilience, "just transitions" for the energy workforce, infrastructure, environmental justice, and other topics. Seven of these 104 bills received at least floor consideration and one, H.R. 1319, became law (The American Rescue Plan Act of 2021, P.L. 117-2).[97]

Finance

As of September 27, 2021, CRS identified 48 bills introduced in the 117th Congress concerning climate change and the financial industry. These bills include provisions regarding climate change risk disclosure and proposals to create climate or green banks, among others. Seven of these 48 bills received floor consideration.

Land Use

As of September 27, 2021, CRS identified 117 bills introduced in the 117th Congress that seek to address land use issues related to climate change. These bills address deforestation, propose carbon sequestration efforts through forestry and agricultural practices, and include provisions regarding coastal resilience and adaptation, among others. Ten of these 117 bills received at least floor consideration.

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[95] The American Rescue Plan Act of 2021 (ARPA) is part of a series of legislative packages to address the impacts of the Coronavirus Disease 2019 (COVID-19) pandemic on the economy, public health, state and local governments, individuals, and businesses (P.L. 117-2). ARPA provisions potentially relevant to energy and climate change issues include funding through FY2022 for the low-income home energy assistance program (Title II, §2911) and funding for public transportation agencies (Title III, §3401).

[96] While there is no single definition of *equity* in the context of climate change impacts, many define *equity* as entailing "fair" treatment of people according to their different circumstances.

[97] ARPA provided $100 million to EPA "to address health outcome disparities from pollution and the COVID-19 pandemic" (P.L. 117-2, Title VI, §6002). For more information about EPA's ARPA implementation, see EPA, "American Rescue Plan (ARP)," https://www.epa.gov/arp.

Executive Branch Approach to Climate Change Mitigation

GHG Targets

Executive branch policies and actions influencing future U.S. GHG emissions are dependent on the policy objectives of each administration. After the United States rejoined the PA, the Biden Administration communicated a new Nationally Determined Contribution (NDC) to the Paris Agreement,[98] which contains a new GHG target for the United States: to reduce net GHG emissions by 50%-52% below 2005 levels by 2030.[99] According to the Biden Administration, the NDC "exceeds a straight-line path to achieve net-zero emissions, economy-wide, by no later than 2050."[100] For comparison, the previous U.S. NDC, released in 2015, set a target of 26%-28% below 2005 levels by 2025, which President Obama had indicated was on a straight-line trajectory to a reduction of 80% below 2005 levels by 2050. The content of NDCs is nationally determined and nonbinding, but it should reflect what a Party to the PA intends to achieve.

Figure 2 shows historical net GHG emissions with the 2015 and 2021 NDCs and the Biden Administration's net-zero emissions goal for 2050. In 2019, U.S. GHG emissions, after accounting for removals by carbon sinks, were 5,769 $MMTCO_2e$.[101] The 2019 net GHG emissions are about 13% below net 2005 levels and about 4% above net 1990 levels.

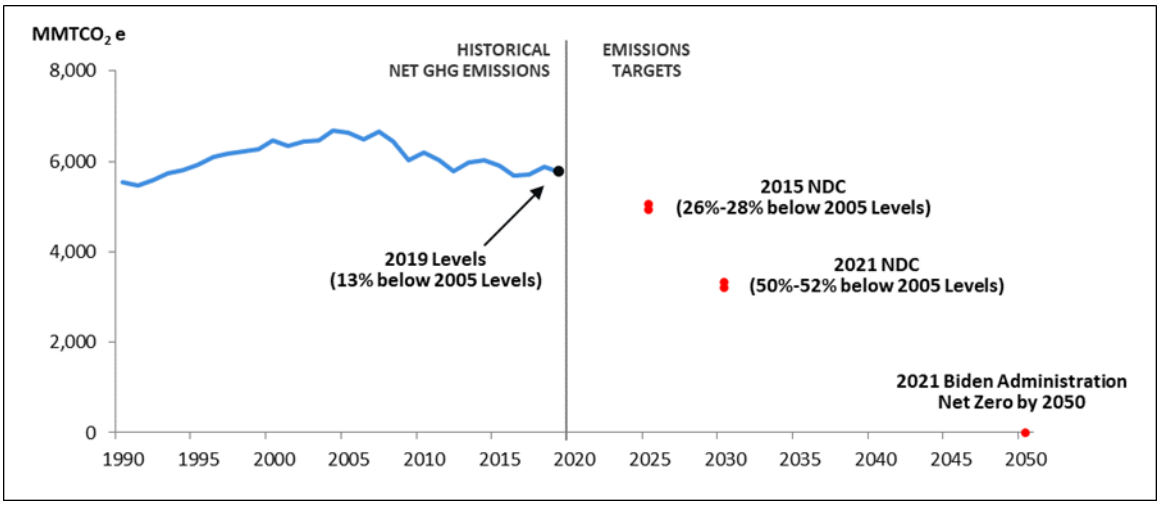
[98] A key requirement of the Paris Agreement (PA) is that all Parties communicate their "Nationally Determined Contributions" (NDC) every five years, containing a GHG reduction pledge and actions, although this content of an NDC is not binding. As the United States has newly (again) become a Party, the United States must submit a new NDC.

[99] The White House, "The United States of America Nationally Determined Contribution Reducing Greenhouse Gases in the United States: A 2030 Emissions Target," April 22, 2021, https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20States%20of%20America%20First/United%20States%20NDC%20April%2021%202021%20Final.pdf. (Hereinafter, 2021 U.S. NDC.)

[100] 2021 U.S. NDC, p. 22.

[101] As previously noted, U.S. gross emissions (not net of sinks) were 6,558 $MMTCO_2e$ in 2019. U.S. sinks removed about 789 MMT in 2019, about 12% of gross emissions (U.S. GHG Inventory, 1990-2019).

Figure 2. U.S. Net GHG Emissions (1990-2019) and Selected Emissions Targets



Source: Prepared by CRS; historical emissions from EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019*, 2021, https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

Notes: Net GHG emissions include net carbon sequestration from land use, land use change, and forestry. This involves carbon removals from the atmosphere by photosynthesis and storage in vegetation. Million metric tons of CO_2 equivalent ($MMTCO_2e$) is used because GHGs vary by global warming potential (GWP). GWP is an index that allows comparisons of the heat-trapping ability of different gases over a period of time. Consistent with international GHG reporting requirements, EPA's most recent GHG inventory (April 2021) uses the GWP values presented in the Intergovernmental Panel on Climate Change (IPCC) 2007 *Fourth Assessment Report* for warming potential over 100 years.

The 2021 NDC also sets a goal to eliminate carbon emissions from the electricity sector by 2035. The Biden Administration reports that it will seek to decarbonize the energy sector in various ways, "including by cutting energy waste; shifting to carbon pollution-free electricity; electrifying and driving efficiency in vehicles, buildings, and parts of industry; and scaling up new energy sources and carriers."[102]

Announced Policies and Rulemakings

In many respects, early executive orders and actions directed by the Biden Administration may be viewed as reinstatement and expansion of policies of the Obama Administration on climate change, with some important differences. In his first three months in office, President Biden rejoined the PA, announced U.S. GHG reduction targets, and centralized executive branch organizations to identify and coordinate climate-related actions. The remainder of this section describes the Biden Administration executive orders addressing climate change, as of September 2021. **Appendix B** provides examples of additional climate-related policy actions, as summarized by White House statements, as of September 2021.

Executive Order 13990, Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis

Executive Order (E.O.) 13990 of January 20, 2021, outlined a federal policy

> to improve public health and protect our environment; to ensure access to clean air and water; to limit exposure to dangerous chemicals and pesticides; to hold polluters

[102] 2021 U.S. NDC, p. 3.

> accountable, including those who disproportionately harm communities of color and low-income communities; to reduce greenhouse gas emissions; to bolster resilience to the impacts of climate change; to restore and expand our national treasures and monuments; and to prioritize both environmental justice and the creation of the well-paying union jobs necessary to deliver on these goals.[103]

To this end, the order directed all executive departments and agencies to immediately review and, as appropriate and consistent with applicable law, consider suspending, revising, or rescinding actions promulgated, issued, or adopted between January 20, 2017, and January 20, 2021. The order specifically listed a number of climate-related actions by agencies to be reviewed by a given date, including EPA's methane standards for the oil and natural gas sector, EPA's and NHTSA's GHG and fuel economy standards for passenger cars and light trucks, and several of DOE's efficiency improvements and appliance standards, among others.[104] Further, the order directed heads of agencies, as appropriate and consistent with applicable law, to reinstate, or move forward with, several other climate-related actions, including proposing new methane guidelines on existing oil- and gas-sector sources, placing a temporary moratorium on the implementation of the Coastal Plain Oil and Gas Leasing Program in the Arctic National Wildlife Refuge, establishing an interagency working group on the social cost of GHGs, and rescinding a number of executive actions, including the March 2019 permit for the Keystone XL pipeline and the Council on Environmental Quality's 2019 draft GHG guidance on the National Environmental Policy Act, among others. It also stated that it is the Administration's policy "to bolster resilience to the impacts of climate change," and effectively reinstated several Obama Administration presidential documents related to climate change adaptation.[105]

[103] Executive Office of the President, "Executive Order 13990 of January 20, 2021, Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis," 86 *Federal Register* 7037-7043, January 25, 2021. Quoted text from E.O. 13990, Section 1.

[104] The full list of actions cited in the order is "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration," 85 *Federal Register* 57398 (September 15, 2020), by September 2021; "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program," 84 *Federal Register* 51310 (September 27, 2019), by April 2021; and "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks," 85 *Federal Register* 24174 (April 30, 2020, Start Printed Page 70382020), by July 2021; "Energy Conservation Program for Appliance Standards: Procedures for Use in New or Revised Energy Conservation Standards and Test Procedures for Consumer Products and Commercial/Industrial Equipment," 85 *Federal Register* 8626 (February 14, 2020), with major revisions proposed by March 2021 and any remaining revisions proposed by June 2021; "Energy Conservation Program for Appliance Standards: Procedures for Evaluating Statutory Factors for Use in New or Revised Energy Conservation Standards," 85 *Federal Register* 50937 (August 19, 2020), with major revisions proposed by March 2021 and any remaining revisions proposed by June 2021; "Final Determination Regarding Energy Efficiency Improvements in the 2018 International Energy Conservation Code (IECC)," 84 *Federal Register* 67435 (December 10, 2019), by May 2021; "Final Determination Regarding Energy Efficiency Improvements in ANSI/ASHRAE/IES Standard 90.1-2016: Energy Standard for Buildings, Except Low-Rise Residential Buildings," 83 *Federal Register* 8463 (February 27, 2018), by May 2021; "National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units—Reconsideration of Supplemental Finding and Residual Risk and Technology Review," 85 *Federal Register* 31286 (May 22, 2020), by August 2021; "Increasing Consistency and Transparency in Considering Benefits and Costs in the Clean Air Act Rulemaking Process," 85 *Federal Register* 84130 (December 23, 2020), as soon as possible; and "Strengthening Transparency in Pivotal Science Underlying Significant Regulatory Actions and Influential Scientific Information," 86 *Federal Register* 469 (January 6, 2021), as soon as possible.

[105] For example, it effectively reinstated E.O. 13653, "Preparing the United States for the Impacts of Climate Change," and E.O. 13693, "Planning for Federal Sustainability in the Next Decade."

Executive Order 14008, Tackling the Climate Crisis at Home and Abroad

E.O. 14008 of January 27, 2021, ordered a whole-of-government approach to addressing climate change and set forth a number of directives with a view toward decisions that support meeting the Administration's GHG reduction targets.[106] The order created a new position of the Special Presidential Envoy for Climate. To coordinate across agencies, E.O. 14008 established a White House Office of Domestic Climate Policy (Climate Policy Office) within the Executive Office of the President led by an Assistant to the President and National Climate Advisor.

E.O. 14008 also established a National Climate Task Force, which is chaired by the National Climate Advisor and composed of departments and major agencies. The order instructed the National Climate Task Force to organize the whole-of-government approach to addressing climate change and to facilitate planning and implementation of federal actions. In particular, E.O. 14008 instructed task force members to "prioritize action on climate change in their policy-making and budget processes, in their contracting and procurement, and in their engagement with State, local, Tribal, and territorial governments; workers and communities; and leaders across all sectors of our economy."[107]

E.O. 14008 called for additional actions, including the following:

- **Adaptation.** Federal agencies must develop Climate Action Plans to improve adaptation and resilience to climate changes. After review by the Federal Chief Sustainability Officer,[108] agencies must report annually on their implementation of the plans.
- **Conservation, Agriculture, and Forestry.** E.O. 14008 called for development of certain strategies and reports related to conservation, agriculture, and forestry. It called for a strategy to create a Civilian Climate Corps to provide jobs and training for conservation, restoration, resilience, carbon sequestration, and other objectives.[109] The E.O. called for a report recommending steps to achieve conservation of at least 30% of U.S. lands and waters by 2030, and included mechanisms to measure progress toward that goal. A preliminary report was released on May 6, 2021.[110] E.O. 14008 also addressed the potential role of farming in addressing climate change and reducing GHG emissions, highlighting opportunities to promote carbon sequestration in soils and to source sustainable bioproducts and biofuels. It required USDA to solicit stakeholder input and issue a report—within 90 days—making recommendations for a climate strategy for agriculture and forestry. USDA released this report on May 20, 2021.[111]
- **Energy and Public Lands.** E.O. 14008 directed the Secretary of the Interior to identify actions that would increase renewable energy production on public lands

[106] Executive Office of the President, "Executive Order 14008 of January 27, 2021, Tackling the Climate Crisis at Home and Abroad," 86 *Federal Register* 7619-7633, February 1, 2021.

[107] E.O. 14008, §203.

[108] A role within the White House Council on Environmental Quality. The Federal Chief Sustainability Officer is to coordinate the review with the Office of Management and Budget.

[109] For more information, see CRS Insight IN11654, *Biden Administration Proposes New Civilian Climate Corps*, by Mark K. DeSantis.

[110] DOI, USDA, DOC, and CEQ, *Conserving and Restoring America the Beautiful*, May 6, 2021, https://www.doi.gov/sites/doi.gov/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf.

[111] USDA, *Climate-Smart Agriculture and Forestry Strategy: 90-Day Progress Report*, May 2021, https://www.usda.gov/sites/default/files/documents/climate-smart-ag-forestry-strategy-90-day-progress-report.pdf.

and in offshore waters, with a goal to double offshore wind production by 2030.[112] It also directed the Secretary to pause new oil and gas leases on public lands or offshore waters pending review and reconsideration of federal oil and gas leasing and permitting practices. It directed the Secretary to consider, among other things, potential climate and other impacts associated with oil and gas activities on federal lands and to consider adjusting royalty rates for coal, oil, and gas extracted from public lands or to take other actions to account for climate costs.[113]

- **Foreign Policy and National Security.** E.O. 14008 increased the prioritization of international actions on climate change, as compared to actions under President Obama and President Trump, establishing the policy that "climate considerations shall be an essential element of United States foreign policy and national security."[114] The Special Presidential Envoy for Climate sits on the National Security Council (NSC), representing the first time the NSC includes a principal fully dedicated to climate change.[115] E.O. 14008 also called for relevant federal agencies to coordinate with the Special Presidential Envoy for Climate to develop strategies and implementation plans for integrating climate considerations into their international work.[116]
- **Infrastructure.** E.O. 14008 directed the Chair of the Council on Environmental Quality (CEQ) and the Director of the Office of Management and Budget (OMB) to (1) ensure that investments in federal infrastructure reduce GHGs; (2) require that permitting decisions consider GHG emission impacts; and (3) identify steps to accelerate clean energy and transmission projects.[117]
- **Procurement.** E.O. 14008 established a policy to align management of federal procurement and real property to "support robust climate action."[118] In particular, it called for the National Climate Advisor and National Climate Task Force, assisted by the heads of relevant federal agencies, to develop a plan that uses available procurement authorities to achieve or facilitate a decarbonized electricity sector by 2035 and the use of clean and zero-emission vehicles for federal, state, local, and tribal government fleets.[119]
- **Transition and Equity (Energy Communities).** E.O. 14008 established an Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization (IWG). The order directed the IWG, which is housed within DOE, to coordinate the delivery of federal resources "to revitalize the economies of coal, oil and gas, and power plant communities," develop strategies

[112] E.O. 14008, §207.

[113] E.O. 14008, §208.

[114] E.O. 14008, §101.

[115] U.S. Department of State, "John Kerry, Special Presidential Envoy for Climate," https://www.state.gov/biographies/john-kerry/.

[116] E.O. 14008, §103.

[117] E.O. 14008, §213.

[118] E.O. 14008, §204.

[119] E.O. 14008, §205.

for economic and social recovery, and evaluate "opportunities to ensure benefits and protections for coal and power plant workers."[120]

- **Transition and Equity (Justice40 Initiative).** E.O. 14008 established the Justice40 Initiative to recommend, in consultation with disadvantaged communities, how to direct certain federal investments such that 40% would flow to "disadvantaged communities."[121] The Administration published "initial recommendations" on July 20, 2021.[122] According to the order, the scope of those federal investments includes clean energy and energy efficiency; clean transit; affordable and sustainable housing; training and workforce development; remediation and reduction of legacy pollution; and critical clean water infrastructure. The initiative must publish an annual Environmental Justice Scorecard.

Executive Order 14027, Establishment of the Climate Change Support Office

E.O. 14027 of May 7, 2021, established, within the Department of State, a temporary organization called the Climate Change Support Office (CCSO).[123] The purpose of the CCSO is to support "bilateral and multilateral engagement to advance the United States' initiative to address" climate change.[124] The CCSO is also intended to "support efforts that go beyond the climate work currently carried out by the Department of State across a wide range of international fora that address clean energy, aviation, shipping, the Artic [sic], the ocean, sustainable development, and migration."[125]

Executive Order 14030, Climate-Related Financial Risk

E.O. 14030 of May 20, 2021, directed federal agencies, including financial regulators, to analyze and mitigate the risks that climate change poses to financial stability.[126] It called for the development of a comprehensive, government-wide strategy that identifies climate-related financial risk to government programs, assets, and liabilities. It also required the strategy to identify financing needs associated with climate change goals, including achieving net-zero greenhouse gas emissions for the U.S. economy by no later than 2050. The order directed financial regulators to assess climate-related financial risks and issue a report that discusses current federal efforts to incorporate climate-related risks into policies and programs. The order also directed agencies to consider taking actions to protect life savings and pensions from climate-related financial risk, and to consider updating procurement and budgetary processes to account for climate-related risk analyses.

[120] E.O. 14008, §218.

[121] E.O. 14008, §223.

[122] Memorandum from Shalanda D. Young, Acting Director, Office of Management and Budget; Brenda Mallory, Chair of the Council on Environmental Quality; and Gina McCarthy, National Climate Advisor, to Heads of Departments and Agencies, July 20, 2021, https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf.

[123] Executive Office of the President, "Executive Order 14027 of May 7, 2021, Establishment of the Climate Change Support Office," 86 *Federal Register* 25947-25948, May 12, 2021.

[124] E.O. 14027, §1.

[125] E.O. 14027, §1.

[126] Executive Office of the President, "Executive Order 14030 of May 20, 2021, Climate-Related Financial Risk," 86 *Federal Register* 27967-27971, May 25, 2021.

Executive Order 14037, Strengthening American Leadership in Clean Cars and Trucks

E.O. 14037 of August 5, 2021, set a nonbinding goal for electrification in the transportation section, namely that 50% of all new passenger cars and light trucks sold in 2030 be zero-emission vehicles, including battery electric, plug-in hybrid electric, or fuel cell electric vehicles.[127] The order also directed EPA and NHTSA to begin work on future rulemakings for multipollutant emissions, including for greenhouse gas emissions, and fuel economy standards for light- and medium-duty vehicles beginning with model year (MY) 2027 and extending at least through MY 2030. Further, the agencies are to begin work on new nitrogen oxides standards beginning in MY 2027, updated GHG emission standards for MYs 2027-2029, and new GHG emission and fuel efficiency standards beginning in MY 2030, for heavy-duty engines and vehicles.

In conjunction with the release of E.O. 14037, the Biden Administration proposed amendments to the existing CAFE and light-duty vehicle GHG emission standards through MY 2026.[128] The proposal was not a joint rulemaking. EPA and NHTSA released their proposals separately, with different MY requirements, target stringencies, and compliance flexibilities. However, both proposals would increase in stringency by approximately 25% between MYs 2023 and 2026, achieving a projected fleet-wide, sales-weighted fuel economy of roughly 48 miles per gallon in 2026. In addition to the amended standards, NHTSA has proposed to fully repeal the SAFE Vehicles Rule, Part One: One National Program,[129] and EPA has announced that it is reconsidering the 2019 withdrawal of California's CAA preemption waiver.[130]

FY2022 Budget Request

E.O. 14008 identifies the budget process as another task through which agencies shall, to the extent permitted by law, prioritize action on climate change.[131] The President's FY2022 budget request, released May 28, 2021, included specific proposals aimed at reducing GHG emissions. For example, the FY2022 budget request included an Administration initiative on infrastructure, the American Jobs Plan, which would invest in climate and clean infrastructure projects, among other things.[132] For more information, see **Appendix B**.

The President's FY2022 budget request stated that in addition to the American Jobs Plan, the Administration proposed an increase of over $14 billion of federal funding, compared to FY2021, to support GHG reductions and increasing adaptation or resilience to climate-related impacts.[133]

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[127] Executive Office of the President, "Executive Order 14037 of August 5, 2021, Strengthening American Leadership in Clean Cars and Trucks," 86 *Federal Register* 43583-43585, August 10, 2021.

[128] EPA, "Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards," 86 *Federal Register* 43726, August 10, 2021; and NHTSA, "Corporate Average Fuel Economy Standards for Model Years 2024-2026 Passenger Cars and Light Trucks," 86 *Federal Register* 49602, September 3, 2021.

[129] NHTSA, "Corporate Average Fuel Economy (CAFE) Preemption: Proposed Rule," 86 *Federal Register* 25980, May 12, 2021.

[130] EPA, "California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment," 86 *Federal Register* 22421, April 28, 2021.

[131] E.O. 14008, §203.

[132] White House, *Statements and Releases: The American Jobs Plan*, March 31, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/.

[133] Office of Management and Budget (OMB), *Budget of the U.S. Government, Fiscal Year 2022*, May 28, 2021, p. 20, https://www.whitehouse.gov/wp-content/uploads/2021/05/budget_fy22.pdf. (Hereinafter, FY2022 Budget Request.)

The President's FY2022 budget request included, among other proposals, the following:[134]

- **Clean Energy Projects and Workforce Development.** The President's FY2022 budget states that it would provide $2 billion for "welders, electricians, and other skilled laborers" to build clean energy projects.[135]
- **Clean Energy, Energy Storage, and Transmission Projects in Rural Communities.** The President's FY2022 budget states that it would provide $6.5 billion for lending.[136]
- **Agriculture and Conservation.** The President's FY2022 budget states that it would provide more than $300 million in "new investments in the next generation of agriculture and conservation," which would include support for voluntary private lands conservation, renewable energy grants and loans, and creation of the Civilian Climate Corps.[137]
- **Efficiency Grants.** The President's FY2022 budget states that it would provide $1.7 billion for retrofits to homes, schools, and federal buildings.[138]
- **Environmental Justice.** The President's FY2022 budget states that it would provide more than $1.4 billion to support "marginalized and overburdened communities," including $936 million toward a new initiative, Accelerating Environmental and Economic Justice.[139] The FY2022 budget also proposes an increase of more than $450 million to support climate mitigation, resilience, adaptation, and environmental justice projects in Indian Country.[140]
- **Federal Procurement and Electric Vehicles.** The President's FY2022 budget states that it would provide $600 million for federal zero-emission vehicles and charging infrastructure.[141]
- **GHG Reductions Under Existing Authorities.** The President's FY2022 budget requests $1.8 billion for EPA programs to address climate change, a $100 million increase for air quality grants to states and tribes to implement programs and reduce GHGs under the Clean Air Act, and an additional $60 million to research climate change impacts on health and the environment.[142]
- **International Climate Change Financing.** The President's FY2022 budget requests $2.5 billion for international climate change programs.[143] It includes a

While the budget request stated that the $14 billion increase was in addition to the American Jobs Plan, some of the specified climate change projects are also listed as American Jobs Plan projects.

[134] Unless otherwise specified, the proposed spending figures were reported in the narrative to the President's FY2022 budget request.

[135] FY2022 Budget Request, p. 20.

[136] FY2022 Budget Request, p. 21.

[137] FY2022 Budget Request, p. 21.

[138] FY2022 Budget Request, p. 20.

[139] FY2022 Budget Request, p. 21.

[140] FY2022 Budget Request, p. 20.

[141] FY2022 Budget Request, p. 20.

[142] EPA's FY2022 budget request does not clearly state whether the $1.8 billion for climate change programs includes the $100 million increase for air quality grants to state and local agencies. EPA, *Fiscal Year 2022: Justification of Appropriation Estimates for the Committee on Appropriations*, May 2021, pp. i-ii, https://www.epa.gov/planandbudget/fy-2022-justification-appropriation-estimates-committee-appropriations.

[143] FY2022 Budget Request, p. 22.

$1.2 billion contribution to the Green Climate Fund (GCF) and $485 million to support other multilateral climate initiatives, including $100 million for international climate adaptation programs.[144] Also the President's budget requests about $700 million for the Department of State and U.S. Agency for International Development to assist developing countries in adapting to climate disruptions, to invest in clean energy, and to reduce GHG "landscape emissions."[145]

- **Methane Reductions from Oil and Gas Systems.** The President's FY2022 budget requests over $580 million to "remediate thousands of abandoned oil and gas wells and reclaim abandoned mines" in order to reduce methane leakage.[146]
- **Technology Research, Development, and Demonstration.** The President's FY2022 budget requests more than $10 billion in "clean energy innovation across nondefense agencies."[147] For example, DOE requested more than $8 billion in clean energy and climate innovation to develop "advanced" nuclear energy technologies,[148] electric vehicles, "green hydrogen,"[149] and innovative approaches to air conditioning and refrigeration.[150] The President's budget request includes a total of $1 billion to establish a new Advanced Research Projects Agency for Climate (ARPA-C), and invest in the existing Advanced Research Projects Agency-Energy, which would both support high-risk funding of climate change adaptation/resilience and GHG mitigation technology development.[151] The Administration expects to house ARPA-C at DOE.[152] Additional agencies contributing to ARPA-C include the departments of Agriculture, Commerce, Homeland Security, Housing and Urban Development, the Interior, and Transportation, and EPA.[153] Secretary of Energy Jennifer

[144] FY2022 Budget Request, p. 22.

[145] FY2022 Budget Request, p. 22. The budget request does not define *landscape emissions* but appears to refer to avoiding or reducing emissions from soils and vegetation, or increasing removals of CO_2 from the atmosphere by photosynthesis. For example, the Administration discusses pursuing "natural climate solutions, such as improving the conservation and management of carbon-rich tropical forests and other important landscapes"; see Department of State, *Congressional Budget Justification: Department of State, Foreign Operations, and Related Programs, Fiscal Year 2022*, pp. 88 and 131, https://www.state.gov/wp-content/uploads/2021/05/FY-2022-State_USAID-Congressional-Budget-Justification.pdf.

[146] FY2022 Budget Request, p. 21.

[147] FY2022 Budget Request, p. 21.

[148] The term *advanced nuclear reactor* is defined by the Energy Act of 2020 (P.L. 116-260, Division Z) as a fission reactor that has "significant improvements" over existing commercial reactors, and any fusion reactor. For more information about advanced nuclear technology, see CRS Report R42853, *Nuclear Energy: Overview of Congressional Issues*, by Mark Holt.

[149] Some refer to hydrogen produced from fossil fuels as "blue hydrogen," if the separated carbon is captured and sequestered, and "gray hydrogen" if it is not; and hydrogen produced from renewable processes as "green hydrogen." For more information, see CRS Report R46436, *Hydrogen in Electricity's Future*, by Richard J. Campbell.

[150] DOE, *Department of Energy: FY 2022 Congressional Budget Request: Budget in Brief*, May 2021, p. 7, https://www.energy.gov/sites/default/files/2021-05/doe-fy2022-budget-in-brief.pdf. (Hereinafter, DOE FY2022 Budget Justification.)

[151] FY2022 Budget Request, p. 22.

[152] DOE's FY2022 Budget Justification requested $200 million to establish the ARPA-C office. See DOE, *FY2022 Congressional Budget Request*, Volume 3, Part 2, p. 357, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-3.2-v3.pdf.

[153] DOE FY2022 Budget Justification, p. 15.

Granholm indicated that the current proposal would initiate "a path to quadruple clean energy research government-wide in four years."[154]

- **Transportation Incentives.** The President's FY2022 budget requests a $174 billion investment in the electric vehicle market, including support for domestic manufacturing of batteries and electric vehicles, consumer point-of-sale rebates and tax incentives to purchase electric vehicles manufactured in the United States, and establishment of grants and incentive programs to build a network of electric vehicle chargers.[155] The President's FY2022 budget also proposes to invest $80 billion for rail improvements, including the development and adoption of clean energy rail propulsion systems, such as near-zero emission diesel locomotives, battery technology, and electrification.[156]

As of September 2021, congressional debate has continued on annual appropriations for FY2022. Appropriators in each chamber have supported some of the Biden Administration's proposals to varying degrees. For more information, see the CRS collection of reports on FY2022 appropriations.[157]

Congress has also considered climate change spending through its work on FY2022 budget reconciliation. Both chambers agreed to a $3.5 trillion budget resolution, S.Con.Res. 14, which established the congressional budget for FY2022, set budgetary levels for FY2023-FY2031, and provided reconciliation instructions to committees in the House and Senate.[158] For more information, see "Legislative Proposals in the 117th Congress."

Issues for Congress

The Biden Administration has increased the ambition of domestic GHG reduction goals compared to previous Administrations, aiming to achieve "net zero" emissions in the next three decades. It has signaled it will pursue its GHG reduction goals through a variety of climate change actions, including both regulatory and nonregulatory measures. Some observers have expressed skepticism that the Administration's GHG reduction goals can be reached absent new or enhanced authorities and appropriations from Congress. As the Biden Administration begins to implement a whole-of-government approach to climate change, Congress may consider issues concerning U.S. GHG targets, policy approaches, and funding.

[154] Secretary of Energy Jennifer Granholm, "Statement by Secretary Granholm on the President's FY22 Discretionary Funding Request," Energy.gov, April 9, 2021, https://www.energy.gov/articles/statement-secretary-granholm-presidents-fy22-discretionary-funding-request.

[155] U.S. Department of Transportation, *2022 Budget Highlights*, May 28, 2021, pp. 16-17, https://www.transportation.gov/mission/budget/fiscal-year-2022-budget-highlights. (Hereinafter, DOT FY2022 Budget Justification.)

[156] DOT FY2022 Budget Justification, pp. 13, 60-61.

[157] For example, see CRS Report R46857, *Energy and Water Development: FY2022 Appropriations*, by Mark Holt and Corrie E. Clark; CRS Report R46908, *Interior, Environment, and Related Agencies: Overview of FY2022 Appropriations*, by Carol Hardy Vincent; and more at CRS, "Appropriations," https://www.crs.gov/iap/appropriations.

[158] S.Con.Res. 14, "A concurrent resolution setting forth the congressional budget for the United States Government for fiscal year 2022 and setting forth the appropriate budgetary levels for fiscal years 2023 through 2031." The Senate agreed to S.Con.Res. 14 on August 11, 2021. The House adopted S.Con.Res. 14 on August 24, 2021. For more information, see CRS Report R46893, *S.Con.Res. 14: The Budget Resolution for FY2022*, by Megan S. Lynch.

GHG Targets and International Commitments

The Biden Administration rejoined the PA, which seeks to hold the GHG-induced "increase in global average temperature to well below 2º Celsius (C)" and to try to limit it to 1.5ºC.[159] In particular, the PA includes a collective commitment to achieve approximately net-zero GHG emissions in the second half of this century.[160] The United States established a new pledge to reduce its economy-wide net GHG emissions by 50%-52% below the 2005 level by 2030, in a required communication, the U.S. Nationally Determined Contribution (NDC) to the PA. See **Figure 2** for historical net GHG emissions compared with these goals.[161] The target itself is not binding. The U.S. NDC also stated that the target "exceeds a straight-line path to achieve net-zero emissions, economy-wide, by no later than 2050."[162] The pledges made in the U.S. NDC and other parties' NDCs to 2030 are intended to support near-term steps in a multidecadal process to avoid adverse impacts on people, economies, and the environmental systems on which societies depend.

U.S. participation in the PA raises issues that Congress may consider, such as the ambition of the U.S. NDC and assessment of other parties' NDCs. Members may be interested in the actions required to fulfill the U.S. NDC, the efficacy of such actions, and the economic and equity implications of such actions. Congress may consider assessing the ambition, relative level of effort, and performance of other parties' GHG mitigation, adaptation, technology, and financing associated with the PA. It could request the executive branch to provide such analysis, conduct its own assessment, or rely on third parties.

Differences in the scope, stringency, and timing of parties' GHG policies may raise concerns for policymakers. One concern many have is that U.S. policies could raise U.S. prices more than the prices of goods manufactured in countries with relatively less stringent climate policies, potentially creating a competitive disadvantage for some domestic businesses. Certain businesses could potentially become less profitable, lose market share, and reduce jobs. In addition, climate policy differences between countries could potentially lead to emissions leakage, which "occurs when economic activity is shifted as a result of the emission control regulation and, as a result, emission abatement achieved in one location [e.g., the United States] that is subject to emission control regulation is [diminished] by increased emissions in unregulated locations."[163]

Policymakers might consider approaches to address these potential outcomes in several ways. One approach that has received interest in recent years is a border carbon adjustment (BCA) mechanism. Several national governments and the EU have discussed imposing BCAs on imported goods from countries that do not make similarly ambitious efforts to reduce GHG emissions. A BCA would likely apply a tariff to emission-intensive imported goods such as steel,

[159] PA, Article 2.

[160] In order to achieve the PA's "long-term temperature goal," parties aim to make their GHG emissions peak as soon as possible and then reduce them rapidly "so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century"; see PA, Article 4. For more information, see CRS Report R44609, *Climate Change: Frequently Asked Questions About the 2015 Paris Agreement*, by Jane A. Leggett and Richard K. Lattanzio.

[161] The United States of America, "Nationally Determined Contribution - Reducing Greenhouse Gases in the United States: A 2030 Emissions Target," United Nations Climate Change NDC Registry (interim), April 21, 2021, https://www4.unfccc.int/sites/NDCStaging/pages/Party.aspx?party=USA.

[162] 2021 U.S. NDC, p. 23.

[163] EPA, Office of Air and Radiation, *Tools of the Trade: A Guide to Designing and Operating a Cap and Trade Program for Pollution Control*, 2003, Glossary.

aluminum, cement, and certain chemicals. Also, China, South Korea, European countries, and others are pursuing investment in low-GHG-emitting technologies in advanced energy, materials, electronics, vehicles, and other sectors that they expect to provide future competitiveness advantages.[164]

Transparency and verification of GHG reductions is another issue potentially of interest to Congress. Some Members may be concerned about whether parties to the PA are taking actions and will achieve their GHG targets. Scientific advances in remote sensing systems, ground-based measurements, and modeling can help the United States and other countries independently verify where entities may be meeting their GHG targets, and where they may be falling behind. Congress may be interested in the federal and international programs that support, or could enhance support for, greater transparency of reporting, verification, and review of GHG emissions and related actions.

U.S. Federal Policy Approaches

If Congress seeks to limit or remove GHG emissions from the atmosphere, then there are a range of policy options it may consider.[165] For example, options include carbon pricing, regulatory approaches, investment in research and development, tax incentives, and federal procurement requirements. A number of these policy tools are currently being implemented in the United States—as discussed earlier in this report—and in other countries, to varying degrees and to support a range of policy objectives.

If there is interest in legislating a national climate mitigation strategy, Congress may assess a range of potential concerns and how particular policies could be designed to address them. Members frequently raise questions about the potential costs of policies and alternative policy designs. Congress may also consider options that help alleviate some of the expected negative consequences from certain emissions mitigation policies. These consequences may include economy-wide impacts, disproportionate costs to lower-income households, and job losses in certain industries, among others. When examining these concerns, policymakers may wish to evaluate the tradeoff between the estimated consequences from mitigation policies and the benefits of reducing emissions and avoiding climate change, among other considerations.

Many actions to reduce GHG emissions may bring co-benefits—positive effects beyond the intended GHG reduction benefits. An example is reduced health care costs and mortality associated with improvements in air quality (e.g., from reductions in non-GHG emissions). Factors relevant to the extent of co-benefits include policy design and depth of GHG reductions.

Congress, in its oversight role, may also consider the feasibility, challenges, and economic impacts associated with the Biden Administration's GHG targets. Some recent studies have examined pathways that rely partly on federal policies to reduce domestic GHG or CO_2 emissions in the next decade.[166] While a synthesis of these studies is beyond the scope of this report, such

[164] See, for example, Innovation and Networks Executive Agency, "Innovation Fund," European Commission, June 14, 2020, https://ec.europa.eu/inea/en/innovation-fund.

[165] For further discussion, see CRS In Focus IF11791, *Mitigating Greenhouse Gas Emissions: Selected Policy Options*, by Jonathan L. Ramseur et al.

[166] For example, see (1) Nathan Hultman, Leon Clarke, and Carla Frisch, et al., "Fusing subnational with national climate action is central to decarbonization: the case of the United States," *Nature Communications*, vol. 11 (October 16, 2020); (2) Nathan Hultman, Leon Clarke, and Haewon McJeon, et al., *Working Paper: Charting an Ambitious U.S. NDC of 51% Reductions by 2030*, University of Maryland Center for Global Sustainability, March 2021; (3) John Larsen, Noah Kaufman, and Peter Marsters, et al., *Expanding the Reach of a Carbon Tax: Emissions Impacts of*

studies highlight issues for congressional consideration, including options and incentives to accelerate development and deployment of decarbonization technologies and regulations for sector-specific or economy-wide emissions targets, should that be a goal. In particular, studies indicate that achieving these emission reduction targets would generally rely on, among other things, increasing use of renewable energy and decreasing use of unabated coal for power generation (i.e., coal-fired generation that does not use carbon capture and sequestration), electrification of end-uses (i.e., replacing technologies that rely on fossil fuel combustion with electrical ones), energy efficiency improvements, reductions in methane leaks in the oil and gas sector, and maintenance of the carbon sink in natural and working lands.[167]

A question policymakers may consider is whether economy-wide or sectoral targets—such as decarbonization of the electricity sector—could be achieved under existing federal authorities as well as through state and local climate change actions. Examples of existing authorities include Clean Air Act regulations, energy efficiency standards, and renewable portfolio standards. Among other considerations, it is unclear whether one of these existing authorities—the Clean Air Act—is well-suited to the Administration's climate change goals or whether it could achieve the more ambitious targets supported by some Members and stakeholders. Members supporting decarbonization might consider legislative options, should existing authorities appear inadequate to achieve emission reduction objectives. As discussed in "Legislative Proposals in the 117th Congress," Congress continues to deliberate new authorities and spending to set and achieve specific GHG reductions, provide tax and other financial incentives to businesses and consumers, and set regulatory performance standards (including clean energy standards), among other policy options.

Climate Change Funding

Congress may consider how federal funding, including appropriations, might influence the Administration's climate change actions. Congress is currently deliberating FY2022 appropriations and budget reconciliation options. As discussed in this report, President Biden directed agencies to prioritize action on climate change through the budget process, among other things, and his Administration's FY2022 budget request included specific proposals aimed at reducing GHG emissions. The Administration's American Jobs Plan appeared to anticipate that hundreds of billions of dollars in new federal funding and tax incentives would stimulate technological advancements and enhance competitiveness of low- or no-GHG emitting technologies, and hence facilitate a long-term transition to a substantially modified and net-zero-emissions economy. Senate Majority Leader Schumer released a letter to colleagues with preliminary estimates of reductions from proposed provisions in the Infrastructure Investment and Jobs Act and budget reconciliation.[168] While the bills have not been enacted as of September 2021, he reported that, with

> the combined impact of both the Infrastructure Investment and Jobs Act and the Budget Resolution's instructions, we are on track to reduce U.S. emissions to approximately 45 percent beneath 2005 levels by 2030. When you add Administrative actions being planned

Pricing Combined with Additional Climate Actions, Center on Global Energy Policy at Columbia University and Rhodium Group, October 20, 2020; (4) Mei Yuan, Alex Barron, and Noelle Selin, et al., *Meeting Potential New U.S. Climate Goals*, MIT Joint Program on the Science and Policy of Climate Change, Report 351, April 2021; and (5) Eric Larson, Chris Greig, and Jesse Jenkins, et al., *Net-Zero America: Potential Pathways, Infrastructure, and Impacts*, Princeton University, Interim Report, December 15, 2020, https://netzeroamerica.princeton.edu/the-report.

[167] Ibid.

[168] Senate Majority Leader Charles E. Schumer, "Dear Colleague," August 25, 2021, https://www.democrats.senate.gov/imo/media/doc/Dear%20Colleague%2008.25.21%20(FINAL).pdf.

> by the Biden Administration and many states - like New York, California, and Hawaii - we will hit our 50 percent target by 2030.

The federal government has long supported research and development efforts beyond those the private sector pursues, with investments in, among other areas, science, technology development, and economic research. Federal research funding could help shape the direction and pace of technological developments that many expect could achieve significant reductions in emissions, or could lower costs, compared with current commercial technologies. Some advocate that further innovation would be useful, and in some instances required, to abate emissions from the industrial sector.[169] Congress may look to provide funding for alternative technologies, whether through research and development, or infrastructure planning. Congress may also consider options to incentivize consumer purchases, either through tax incentives, mandates, or government procurement policies.

Members of Congress have expressed differing viewpoints concerning the scope of IIJA and the Build Back Better Act and each proposal's spending priorities.[170] Some Members of Congress have called for greater spending on climate change and social programs, such as education and health care. Other Members of Congress have raised concerns that total proposed spending levels are too high and that these legislative proposals invest in climate change and social programs at the expense of programs, such as roads and bridges, they regard as higher priorities.

Finally, Congress appropriates funds for the State Department's and Department of the Treasury's contributions to foreign assistance. Further, Congress has sole authority to lay tariffs and regulate foreign commerce—the most direct way being through Trade Promotion Authority. That is, it is the authority that Congress uses to establish trade-negotiating objectives. The most recent authority (P.L. 114-26) expired on July 1, 2021. Congress may consider whether any new authority should be written to include objectives on climate.

[169] For further information on the potential role of research and development, see GHG-related sections in CRS Report R46787, *Science and Technology Issues in the 117th Congress*, coordinated by Frank Gottron and Brian E. Humphreys.

[170] Members of Congress have also disagreed about various other provisions of the legislative proposals, such as the tax provisions in the Build Back Better Act.

Appendix A. Climate Change Legislation in the 117th Congress: Search Methodology

The "Legislative Proposals in the 117th Congress" section of this report identified bills by running a number of searches in Congress.gov, an authoritative and up-to-date resource for legislation, which is updated daily when Congress is in session. Initial searches were run in May 2021 and subsequent searches were run to update legislation until September 27, 2021. CRS compiled a list of search terms related to adaptation, greenhouse gas emissions (including sources of emissions by economic sector), climate change mitigation (including technologies), climate change impacts, climate change economics, climate change finance, and research and development. CRS also sought to include terms relevant to climate change policy at an international scale (such as potential U.S. participation in international agreements or bilateral or multilateral funding assistance). CRS grouped these terms within five broad categories: adaptation, energy, equity, finance, and land use. Each of the five searches was run in the full text of all legislation introduced in the 117th Congress, and results were downloaded into Excel for analysis.[171] Individual search results were tagged with the broad topic tag associated with the search from which they resulted (i.e., "adaptation" or "finance"). Duplicate bills (i.e., bills that were identified in more than one search) were assigned a broad topic tag for each search in which they were identified, and then all but one listing was removed from analysis. Amendments and resolutions were also removed from the spreadsheet. CRS identified a number of bills as not relevant—meaning these bills contained search terms but did not translate to relevant provisions—by reviewing titles, summaries (where available), and full text. CRS removed these bills from consideration. CRS also included all relevant related and companion bills (as identified in Congress.gov) in analysis. Additional searches were run using the "introducedDate:" function in Congress.gov to identify both newly introduced legislation as well as updated bill status and other metadata that may have changed since the prior search.

Bill Status Table

Table A-1 was created by using Congress.gov's "Status of Legislation" filter in each set of search results. Each set of results was limited to the following statuses: Became Public Law, Passed Both Chambers, Passed One Chamber, or Floor Consideration. Thirty-four of the more than 750 legislative proposals that CRS identified progressed beyond introduction in the legislative process, as of September 27, 2021, and are identified in **Table A-1**. Many of these bills fit into multiple broad topic categories. Also, some bills may contain relatively small provisions addressing climate change, while others are solely focused on that topic in one or more sectors. Twenty-seven of the 34 bills fell within the energy category, and 18 of the 34 fell within the adaptation category. **Table A-1** reflects the September 27, 2021, search, the most recent search conducted for this report.

[171] Search results available at the following links: Adaptation: https://go.usa.gov/xMhxN; Energy: https://go.usa.gov/xMhxR; Equity: https://go.usa.gov/xMhxn; Finance: https://go.usa.gov/xMhxQ; and Land use: https://go.usa.gov/xMhxU.

Table A-1. Selected Climate Change Legislation in the 117th Congress

Status of bills that have at least received floor consideration

Bill No.	Title	Broad Sector Tag(s)	Vote Information (date)	Last Action if not vote (date)
S. 914	Drinking Water and Wastewater Infrastructure Act of 2021	Adaptation, energy, equity	Passed Senate 89-2 (4/29/21); Record Vote Number 178	Committee report filed; Report No. 117-20 (5/10/2021)
S. 1251	Growing Climate Solutions Act of 2021	Energy, land use	Passed Senate 92-8 (6/24/21); Record Vote Number 251	Received in House and held at desk (6/24/21)
S. 1260	United States Innovation and Competition Act of 2021	Adaptation, energy, finance	Passed Senate 68-32 (5/28/21); Record Vote Number 226	
S. 2093	For the People Act of 2021	Adaptation, energy	Cloture not invoked (6/22/21); Record vote 246	Cloture motion on the motion to proceed to the measure withdrawn by unanimous consent in Senate (9/15/2021)
H.R. 1	For the People Act of 2021	Adaptation, energy	Passed House 220-210 (3/3/21); Roll call vote number 62	Received in the Senate (3/11/21)
H.R. 447	National Apprenticeship Act of 2021	Adaptation, energy, equity	Passed House 247-173 (2/5/21); Roll call vote number 31	Received in Senate and referred to Committee on Health, Education, Labor, and Pensions (2/25/21)
H.R. 610	San Francisco Bay Restoration Act	Adaptation, energy	Passed/agreed to in House under suspension of the rules (6/15/2021)	Received in Senate and referred to Committee on Environment and Public Works (6/16/2021)
H.R. 803	Protecting America's Wilderness and Public Lands Act	Energy, equity, land use	Passed House 227-200 (2/26/21); Roll call vote number 45	Received in Senate and referred to Committee on Energy and Natural Resources (3/2/2021)
H.R. 1144	Promoting United Government Efforts to Save Our Sound Act	Adaptation, energy	Passed/agreed to in House under suspension of the rules (6/15/2021)	Received in Senate and referred to Committee on Environment and Public Works (6/16/2021)

Bill No.	Title	Broad Sector Tag(s)	Vote Information (date)	Last Action if not vote (date)
H.R. 1157	Department of State Authorization Act of 2021	Energy	Passed/agreed to in House under suspension of the rules (5/18/2021)	Received in Senate and referred to Committee on Foreign Relations (5/19/2021)
H.R. 1187	Corporate Governance Improvement and Investor Protection Act	Adaptation, energy, finance	Passed House 215-214 (6/16/21); Roll call vote number 169	Received in Senate and Referred to Committee on Banking, House, and Urban Affairs (6/17/2021)
H.R. 1319	American Rescue Plan Act of 2021	Energy, equity	Many votes held; see Congress.gov for details.	Became P.L. 117-2 (3/11/21)
H.R. 1374	Enhancing State Energy Security Planning and Emergency Preparedness Act of 2021	Energy	Passed House 389-21 (6/22/2021); Roll call vote number 173	Received in Senate and referred to Committee on Energy and Natural Resources (6/23/2021)
H.R. 1447	COAST Research Act of 2021	Energy	Passed under suspension of the rules (5/18/21)	Received in Senate and referred to Committee on Commerce, Science, and Transportation (5/19/2021)
H.R. 1490	504 Modernization and Small Manufacturer Enhancement Act of 2021	Energy	Passed House 400-16 (4/15/2021); Roll call vote number 116	Received in Senate and referred to Committee on Small Business and Entrepreneurship (4/19/2021)
H.R. 1603	Farm Worker Modernization Act of 2021	Adaptation, energy	Passed House 247-174 (3/18/21); Roll call vote number 93	Received in the Senate and referred to Committee on Judiciary (3/22/2021)
H.R. 2225	National Science Foundation for the Future Act	Adaptation, energy	Passed House 345-67 (6/28/2021); Roll call vote number 186	Received in Senate and referred to Committee on Health, Education, Labor, and Pensions (7/12/2021)
H.R. 2467	PFAS Action Act of 2021	Energy	Passed House 241-183 (7/21/2021); Roll call vote number 217	Received in Senate and referred to Committee on Environment and Public Works (7/22/2021)

Bill No.	Title	Broad Sector Tag(s)	Vote Information (date)	Last Action if not vote (date)
H.R. 2471	Haiti Development, Accountability, and Institutional Transparency Initiative Act	Adaptation, energy	Passed/agreed to in House under suspension of the rules (6/29/21)	Received in Senate and referred to Committee on Foreign Relations (4/21/2021)
H.R. 2533	NEAR Act of 2021	Adaptation, energy	Passed/agreed to in House under suspension of the rules (5/18/21)	Received in Senate and referred to Committee on Commerce, Science, and Transportation (5/19/2021)
H.R. 2931	Enhancing Grid Security through Public-Private Partnership Act	Energy	Passed/agreed to in House by voice vote (7/19/2021)	Received in Senate and referred to Committee on Energy and Natural Resources (7/20/2021)
H.R. 3119	Energy Emergency Leadership Act	Energy	Passed/agreed to in House by voice vote (7/19/2021)	Received in Senate and referred to Committee on Energy and Natural Resources (7/20/2021)
H.R. 3593	Department of Energy Science for the Future Act	Adaptation, energy	Passed House 351-68 (6/28/2021); Roll call vote number 187	Received in Senate and referred to Committee on Energy and Natural Resources (7/12/2021)
H.R. 3684	Infrastructure Investment and Jobs Act	Adaptation, energy, equity, finance	Passed Senate 69-30 (8/10/2021); Record vote number 314	House – Postponed Proceedings (9/28/2021)
H.R. 4350	National Defense Authorization Act for Fiscal Year 2022	Adaptation, energy, equity, finance	Passed House 316-113 (9/23/2021); Roll call vote number 293	
H.R. 4373	Department of State, Foreign Operations, and Related Programs Appropriations Act, 2022	Energy, finance	Passed House 217-212 (7/28/2021); Roll call vote number 243	Received in Senate (7/29/2021)

Bill No.	Title	Broad Sector Tag(s)	Vote Information (date)	Last Action if not vote (date)
H.R. 4502	Labor, Health and Human Services, Education, Agriculture, Rural Development, Energy and Water Development, Financial Services and General Government, Interior, Environment, Military Construction, Veterans Affairs, Transportation, and Housing and Urban Development Appropriations Act, 2022	Adaption, energy, equity	Passed House 219-208 (7/29/2021); Roll call vote number 247	Received in Senate (8/3/2021)

Source: CRS, compiled from Congress.gov.

Notes: This table provides a complete list of the bills that have at least received floor consideration, and was last updated September 27, 2021. "Floor consideration" includes House and Senate bills that have received consideration on the floor of either chamber including taking up, amending, debate, voting, passage, amendments between chambers, and conference actions. This bill status does not include actions taken in committees. For more information see https://www.congress.gov/help/action-search-scope-notes.

Search Limitations

These searches reflect the best available information from Congress.gov within the specified time frame, but there are some limitations. First, there are many ways to define, consider, and address climate change. Legislative proposals may specify climate change as an objective. Other proposals that may be considered directly or indirectly relevant to climate change may not expressly state climate change as an objective. Some bills may contain only small provisions that met search criteria, while others are solely focused on addressing climate change in one or more sectors. Stakeholders may also disagree about the extent to which proposals may be relevant to climate change. CRS designed broad searches in an effort to capture the many ways that Members of Congress and stakeholders have considered climate change. Given the broad scope and variability of the subject matter, these and any other searches for "climate change legislation" should be viewed as illustrative rather than a definitive record.

Second, the search results should be viewed as a snapshot in time. Bills typically change as they move through the legislative process, both in content and for procedural reasons. In some instances, the searches may not have captured all such revisions. As previously noted, the Congress.gov database is updated daily when Congress is in session, but the full text of different bill versions and additional metadata may be added over time, affecting search results.

Appendix B. Selected Additional Actions in the Executive Branch

The Biden Administration has begun implementing its whole-of-government approach to addressing climate change. This appendix identifies examples of climate-related policy actions as summarized by the following White House statements, in alphabetical order, as of September 2021. The actions and proposals summarized in this section do not constitute a comprehensive list of efforts by the Biden Administration.

- **American Jobs Plan.** The Administration's American Jobs Plan proposed a total of $2 trillion in federal funding and outlined many incentives and investments in U.S. jobs, infrastructure, and market competitiveness. The plan targeted 40% of the benefits of climate and clean infrastructure investments to disadvantaged communities. The plan also proposed to invest in rural communities and communities affected by the market-based transition to clean energy, among other climate change initiatives.[172] It called on Congress to fund $35 billion "to achieve technology breakthroughs that address the climate crisis and position America as the global leader in clean energy technology and clean energy jobs."[173] Congressional deliberations subsequently focused on a different but related infrastructure plan, known as the "Bipartisan Infrastructure Framework" (BIF), a $1.2 trillion plan that would authorize $579 billion in new spending on transportation infrastructure, power infrastructure, climate resiliency, and other initiatives.[174] A group of Senators reached agreement with President Biden on the BIF and drafted legislation. See "Legislative Proposals in the 117th Congress" for more information.
- **Building Modernization Proposals.** There are a number of proposals to fund building modernization. For example, CEQ, DOE, the General Services Administration (GSA), and EPA announced $30 million in new federal investments to modernize and upgrade the nation's residential and commercial buildings to be affordable, resilient, accessible, energy efficient, and electrified.[175] As another example, DOE requested an increase of $387 million for the Federal Energy Efficiency Fund to improve the climate resilience of federal buildings.[176]

[172] White House, *Statements and Releases: The American Jobs Plan*, March 31, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/. (Hereinafter, American Jobs Plan Fact Sheet.)

[173] American Jobs Plan Fact Sheet.

[174] Sen. Mitt Romney, "Senators' Joint Statement and Framework on Bipartisan Infrastructure Deal," press release, June 24, 2021, https://www.romney.senate.gov/senators-joint-statement-framework-bipartisan-infrastructure-deal. See also Sen. Mark R. Warner, "Warner, President Biden & Senate Colleagues Announce Bipartisan Agreement on Infrastructure," press release, June 24, 2021, https://www.warner.senate.gov/public/index.cfm/2021/6/warner-president-biden-senate-colleagues-announce-bipartisan-agreement-on-infrastructure.

[175] White House, "Biden Administration Accelerates Efforts to Create Jobs Making American Buildings More Affordable, Cleaner, and Resilient," fact sheet, May 17, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/05/17/fact-sheet-biden-administration-accelerates-efforts-to-create-jobs-making-american-buildings-more-affordable-cleaner-and-resilient/.

[176] DOE, FY2022 Congressional Budget Request, Volume 3, Part 1, p. 198, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-3.1-v3.pdf.

- **Climate Innovation Working Group Formation.** The Administration announced a Climate Innovation Working Group and discussed funding to support "transformational low-carbon energy technologies."[177]
- **Coal and Power Plant Community Economic Revitalization Plan.** The Administration released a report that identifies communities affected by coal mine and power plant closures ("energy communities") that should be prioritized for federal investment, details existing resources for these communities, and provides recommendations for further actions.[178]
- **Electric Vehicle Charging Infrastructure Plan.** The departments of Transportation and Energy, and the GSA, announced a suite of actions intended to accelerate the deployment of electric vehicles and charging stations.[179]
- **Financial Sector Oversight (Assessing Climate Risks and Disclosures).** U.S. financial regulators and the Biden Administration have taken public steps toward focusing financial regulatory attention on assessing climate risks to the financial system, including whether, and how, current standards for disclosure of climate risks are being followed and how they might be updated. The Biden Administration is reportedly working on a government-wide strategy, under an upcoming executive order, to better assess climate-related risks for public and private financial assets.[180] Several key financial agencies have announced they are looking at updating existing climate-related risk guidance. Treasury Secretary Janet Yellen flagged climate change as "an existential threat" and the biggest emerging risk to the health of the U.S. financial system, at the first meeting of the Financial Stability Oversight Council (FSOC), established after the 2008 financial crisis so the heads of financial agencies could coordinate regarding emerging risks.[181] She reiterated in a July 11, 2021, speech that the FSOC would assess the potential risk climate change may pose to the financial stability of the United States, and would complement the SEC's work on improved financial disclosures of climate-related risks.[182]

[177] White House, "Biden-Harris Administration Launches American Innovation Effort to Create Jobs and Tackle the Climate Crisis," press release, February 11, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/11/biden-harris-administration-launches-american-innovation-effort-to-create-jobs-and-tackle-the-climate-crisis/.

[178] White House, "Biden Administration Outlines Key Resources to Invest in Coal and Power Plant Community Economic Revitalization," fact sheet, April 23, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-biden-administration-outlines-key-resources-to-invest-in-coal-and-power-plant-community-economic-revitalization/. See also National Energy Technology Laboratory, *Initial Report to the President on Empowering Workers Through Revitalizing Energy Communities*, April 2021, https://netl.doe.gov/IWGInitialReport.

[179] White House, "Biden Administration Advances Electric Vehicle Charging Infrastructure," fact sheet, April 22, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-biden-administration-advances-electric-vehicle-charging-infrastructure/.

[180] The strategy is to be drafted by the National Economic Council and National Climate Advisor Gina McCarthy, in coordination with Treasury Secretary Janet Yellen and the Office of Management and Budget, according to media reports. See, for example, Jenny Leonard, "Biden Plans to Order Climate Risk Strategy for Financial Assets," *Bloomberg News*, April 8, 2021, at https://www.bloomberg.com/news/articles/2021-04-08/biden-plans-to-order-climate-risk-strategy-for-financial-assets. See also Climate 21 Project, *Transition Memo*, https://climate21.org/documents/C21_OMB.pdf.

[181] Victoria Guida, "Janet Yellen: Climate Change Poses 'Existential Threat' To Financial Markets," *Politico*, March 31, 2021, https://www.politico.com/news/2021/03/31/yellen-climate-change-fsoc-478769.

[182] Remarks by Secretary of the Treasury Janet L. Yellen at the Venice International Conference on Climate, July 11,

- **Financial Sector Oversight (Federal Reserve).** On January 25, 2021, the Federal Reserve announced the creation of an internal Supervision Climate Committee (SCC) to "strengthen the Federal Reserve's capacity to identify and assess financial risks from climate change" and to "develop an appropriate program to ensure the resilience of supervised firms to climate-related financial risks."[183] In March 2021, the Federal Reserve announced the creation of a Financial Stability Climate Committee (FSCC) to identify, assess, and address climate-related risks to financial stability from a macro-prudential perspective.[184] On July 11, 2021, Fed Vice Chair for Supervision Randall Quarles flagged the Financial Stability Board's (FSB's) publication of a roadmap for addressing climate-related financial risks.[185] The FSB roadmap is aimed at supporting international coordination of climate disclosures for standard-setting bodies internationally,[186] although Quarles did not specifically address any additional steps by the United States or the Federal Reserve. On December 15, 2020, the Federal Reserve Board joined the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), a group of central banks and supervisory authorities from around the world developing best practices on climate risk management for the financial sector.[187]
- **Financial Sector Oversight (Securities Disclosures).** On July 28, 2021, Securities and Exchange Commission (SEC) Chair Gary Gensler said he had requested that the SEC's staff develop a mandatory climate risk disclosure rule proposal for the commission's consideration by the end of 2021.[188] He noted that such mandatory disclosures should be "consistent and comparable," enabling investors to compare both qualitative and quantitative metrics across companies.[189] He suggested quantitative disclosures could include metrics related to greenhouse gas emissions, financial impacts of climate change, and progress toward climate-related goals.[190] In February 2021, the former Acting Chair of the SEC, Allison Herren Lee, directed the SEC's Division of Corporation Finance to

2021, https://home.treasury.gov/news/press-releases/jy0271.

[183] Federal Reserve Bank of New York, "Kevin Stiroh to Step Down as Head of New York Fed Supervision to Assume New System Leadership Role at Board of Governors on Climate," press release, January 25, 2021, https://www.newyorkfed.org/newsevents/news/aboutthefed/2021/20210125.

[184] Federal Reserve Board Governor Lael Brainard, "Financial Stability Implications of Climate Change," speech at "Transform Tomorrow Today" Ceres 2021 Conference, Boston, March 23, 2021, https://www.federalreserve.gov/newsevents/speech/brainard20210323a.htm.

[185] Federal Reserve Vice Chair for Supervision Randal K. Quarles, "Disclosures and Data: Building Strong Foundations for Addressing Climate-Related Financial Risks," speech at the Venice International Conference on Climate Change, Venice, Italy, July 11, 2021, https://www.federalreserve.gov/newsevents/speech/quarles20210711a.htm.

[186] See Financial Stability Board, "FSB Roadmap For Addressing Climate-Related Financial Risks," July 7, 2021, https://www.fsb.org/2021/07/fsb-roadmap-for-addressing-climate-related-financial-risks/.

[187] Federal Reserve Board, "Federal Reserve Board Announces It Has Formally Joined the Network of Central Banks and Supervisors for Greening the Financial System, or NGFS, as a Member," press release, December 15, 2020, https://www.federalreserve.gov/newsevents/pressreleases/bcreg20201215a.htm.

[188] SEC Chair Gary Gensler, "Prepared Remarks Before the Principles for Responsible Investment 'Climate and Global Financial Markets' Webinar," July 28, 2021, Washington, DC, https://www.sec.gov/news/speech/gensler-pri-2021-07-28. (Hereinafter, Gensler, "Prepared Remarks.")

[189] Gensler, "Prepared Remarks."

[190] Gensler, "Prepared Remarks."

enhance its focus on climate-related disclosure in public company filings.[191] She noted that the SEC would assess compliance related to disclosure of climate change risks under the SEC's existing 2010 guidance, and would start updating that 2010 SEC guidance.[192] The SEC also announced in March 2021 the creation of a "Climate and ESG [Environmental, Social and Governance] Task Force" within the SEC's Division of Enforcement to identify ways to proactively identify ESG-related misconduct.[193]

- **International Climate Finance Plan.** U.S. agencies that work with development partners (e.g., the departments of State and the Treasury, U.S. Agency for International Development, the Millennium Challenge Corporation) announced a plan containing directives to (1) mobilize financial resources, both public and private, to assist developing countries to reduce and/or avoid greenhouse gas emissions and build resilience and adapt to the impacts of climate change; (2) scale back public investments in carbon-intensive fossil-fuel-based energy; (3) make international capital flows consistent with low-emissions, climate-resilient pathways; and (4) better define, measure, and report U.S. international climate finance. The plan states an intention to double, by 2024, the U.S. annual public climate finance to developing countries, including tripling its annual adaptation finance, "relative to the average level during the second half of the Obama Administration."[194] According to the U.S. Government Accountability Office, the average annual funding for climate change international assistance over the period 2013-2016 was $1.177 billion.[195]
- **Offshore Wind Energy Plan.** The U.S. departments of the Interior, Energy, Commerce, and Transportation announced new leasing, funding, and development goals to accelerate and deploy offshore wind energy.[196]
- **Paris Agreement Accession.** The Administration accepted on behalf of the United States the Paris Agreement, the second major subsidiary agreement for international cooperation under the United Nations Framework Convention on Climate Change.[197]

[191] Acting SEC Chair Allison Herren Lee, "Statement on the Review of Climate-Related Disclosure," February 24, 2021, https://www.sec.gov/news/public-statement/lee-statement-review-climate-related-disclosure.

[192] Acting SEC Chair Allison Herren Lee, "Statement on the Review of Climate-Related Disclosure," February 24, 2021, https://www.sec.gov/news/public-statement/lee-statement-review-climate-related-disclosure. Since total market capitalization of the U.S. stock market at the end of 2020 was roughly $50.8 trillion, the financial implications of adequate disclosure of risks from climate change for equity investors is potentially large. The $50.8 trillion figure represents the total market capitalization of all U.S.-based public companies listed on the New York Stock Exchange, Nasdaq Stock Market, or OTCQX U.S. Market, according to Siblis Research, "Total Market Value of U.S. Stock Market," https://siblisresearch.com/data/us-stock-market-value/.

[193] U.S. Securities and Exchange Commission (SEC), "SEC Announces Enforcement Task Force Focused on Climate and ESG Issues," press release 2021-42, March 4, 2021, https://www.sec.gov/news/press-release/2021-42.

[194] White House, "Executive Summary: U.S. International Climate Finance Plan," April 22, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/executive-summary-u-s-international-climate-finance-plan/.

[195] U.S. Government Accountability Office, *Climate Change: Analysis of Reported Federal Funding*, GAO-18-223, April 2018, p. 84, https://www.gao.gov/products/gao-18-223.

[196] White House, "Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs," fact sheet, March 29, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/.

[197] White House, "Paris Climate Agreement, Acceptance on Behalf of the United States of America," January 20, 2021,

- **President Biden's Leaders Summit on Climate.** The Administration convened a summit with "heads of state and government, as well as leaders and representatives from international organizations, businesses, subnational governments, and indigenous communities" to discuss international climate ambition, among other things.[198]
- **Resilience Funding.** The Federal Emergency Management Agency (FEMA) announced three pre-disaster funding opportunities intended to help states and communities increase their preparedness in advance of climate-related extreme weather events and other disasters, and improve their ability to recover after these events. The FEMA initiatives include (1) $1 billion in funding for its Building Resilient Infrastructure and Communities (BRIC) program for FY2021; (2) $3.46 billion in funding for its Hazard Mitigation Grant Program (HMGP); and (3) $160 million in funding for its Flood Mitigation Assistance (FMA) grant program for FY2021.[199]
- **U.S.-Germany Climate and Energy Partnership.** President Biden and German Chancellor Angela Merkel jointly launched the U.S.-Germany Climate and Energy Partnership.[200]

https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/paris-climate-agreement/. For more information, see CRS In Focus IF11746, *United States Rejoins the Paris Agreement on Climate Change: Options for Congress*, by Jane A. Leggett.

[198] White House, "President Biden's Leaders Summit on Climate," April 23, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/.

[199] White House, "Biden Administration Announces Nearly $5 Billion in Resilience Funding to Help Communities Prepare for Extreme Weather and Climate-Related Disasters," fact sheet, August 9, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/09/fact-sheet-biden-administration-announces-nearly-5-billion-in-resilience-funding-to-help-communities-prepare-for-extreme-weather-and-climate-related-disasters/.

[200] White House, "U.S.-Germany Climate and Energy Partnership," fact sheet, July 15, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/15/fact-sheet-u-s-germany-climate-and-energy-partnership/.

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