Testimony before the U.S. House Energy and Commerce Committee
"American Energy Expansion: Strengthening Economic, Environmental, and National Security"
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Good morning, Chair Rodgers, Ranking Member Pallone and the Members of the committee. I am Ana Unruh Cohen and I most recently served as the Majority staff director for the Select Committee on the Climate Crisis. I came to DC in August 2001 with a freshly minted doctorate in Earth Science. I was eager to explore how a climate scientist could contribute to national policy and have subsequently worked in some form on every major energy and climate legislation that Congress has considered during that time. The highlight of my career was serving as staff director for the Select Committee during the last four years under the leadership of Rep. Kathy Castor and with other Members of this committee.

The last four years were also tumultuous for global energy markets and consequential for climate policy. Between the economic impact of pre-vaccine Covid lockdowns, ongoing supply chain disruptions, Russia's invasion of Ukraine, and extreme weather events, it's become clearer than ever that the United States needs to invest in building an energy economy that meets the needs of the 21st century. The tools we have for meeting these challenges have also changed during the last decade. The cost of solar, wind, batteries and other renewable technologies have plummeted even as U.S. shale development has influenced global oil and methane markets. To thrive we will need affordable energy that address the climate crisis, improves public health, and reduces our reliance on volatile global powers and their resources.

The legislation enacted in the 116th and 117th Congresses, especially the Infrastructure Investment and Jobs Act (IIJA), the Inflation Reduction Act (IRA), and the CHIPS and Science Act, make critical down payments on achieving those goals. We are already seeing the benefits of these laws accrue across America and we will see even more in the coming years as we accelerate our transition to a net-zero emission, clean energy economy.

The need for the clean energy transition is clear and growing in urgency. The United States faced 35 "billion-dollar" extreme weather and climate-related disaster events in 2021 and 2022, with a cumulative price tag of more than $180 billion in direct economic losses alone.[1] Other countries around the world have also faced devasting heatwaves, droughts and floods in recent years. Without action, the science points toward continued global catastrophe. In fact, the

[1] National Centers for Environmental Information, "Summary Stats | Billion-Dollar Weather and Climate Disasters," *National Oceanic and Atmospheric Administration*, 2022.

United Nations Secretary General Antonio Guterres referred to the IPCC Sixth Assessment Report as a "code red for humanity," pointing to its dire findings on some of the irreversible trends set in motion by climate change.[2] However, the IPCC also concluded that it is still technologically possible to halve global climate pollution by 2030 and warned that global climate pollution must peak by 2025 in order to avoid the worst devastation.[3]

The transition to a net-zero emission economy will require governments at all levels to increase their engagement on energy and climate policies to realize the potential created by recent legislation and to use the available tools to ease impacts on families when new climate and energy challenges arise. Congress, and especially this committee, will need to understand and respond to the increasingly dynamic global energy landscape to maintain U.S. global leadership and competitiveness.

Energy and climate are inextricably linked

Every energy decision has implications for the climate system. Every energy decision impacts the amount of heat-trapping pollution in the atmosphere. We are already experiencing the consequences of the ~1°C increase in global temperatures –largely from burning fossil fuels— and the increasing risks to health, the economy and national security. Based on the extensive collection of scientific and economic research, the Council of Economic Advisors noted that:

> A growing literature suggests that as temperatures and sea levels rise, and extreme weather becomes more common, the physical damages that stem from the warming of the planet will have substantial, adverse effects on macroeconomic outcomes at the local, national, and international levels. Though not all caused by climate change, across the United States, estimated damages from storms, floods, wildfires, and other extreme weather events have grown to about $120 billion a year from 2016-2020. Climate-driven extreme events can also result in cascading damages to critical and interconnected systems such as energy, public health, ecosystems, water, and food. These damages have a variety of effects on the economy, including but not limited to straining government budgets, changing asset values and insurance costs, and shifting migration patterns and labor supply. The economic effects vary across U.S. regions and industries and will likely disproportionately harm disadvantaged communities.[4]

The energy sector has also experienced the impacts of extreme weather and other consequences of the climate crisis. In recent years, electricity failures have occurred from

[2] United Nations, "IPCC report: 'Code red' for human driven global heating, warns UN chief," *UN News,* August 9, 2021.
[3] IPCC, "Climate Change 2022: Mitigation of Climate Change," 2022.
[4] Council of Economic Advisers, "Climate-related Macroeconomic Risks and Opportunities," April 4, 2022, pg 3-4.

extreme temperatures – both heat and cold – and from destruction from wildfires and storms. The water cycle is incredibly sensitive to climate change leading to challenges for water used in energy production, cooling of thermal electricity generation and hydropower. Rising sea levels puts coastal energy facilities at risk to flooding even as increasing temperatures contribute to the severity of storms. Extreme rainfall events increase the risk of flooding and failures at energy waste facilities across America. As in the rest of society and the economy, the climate crisis is exposing and exacerbating vulnerabilities in the energy sector and underscoring the need for change.

Government and private investments are also responding to the climate crisis and the need for climate pollution to peak in the next few years and then reduce to achieve a net-zero emissions by mid-century, if not sooner. For the first time in 2022, investments in the clean energy transition reached the same level as fossil fuel investments at $1.1 trillion.[5] Despite reaching this level, the clean energy transition needs three times this level of investment for the rest of the decade to achieve transition to a net-zero economy according to analysis by Bloomberg NEF. BP's annual energy outlook also found that governments and industries are behind in the transition to net-zero emissions by 2050.[6]

Climate considerations are not the only driving force behind increased interest in clean energy. The Russian invasion of Ukraine has refocused attention on energy security, especially ways to meet their energy needs with domestic resources. According to BP's chief economist, "The increased focus on energy security as a result of the Russia-Ukraine war has the potential to accelerate the energy transition as countries seek to increase access to domestically produced energy, much of which is likely to come from renewables and other non-fossil fuels."[7] The importance of leadership in clean energy technologies and investments will only grow in the coming years.

China already has a head start on the rest of the world in clean energy investments. Just less than half of the global energy transition funding in 2022 comes from China's $546 billion spending. The United States trails in a very distant second place with $141 billion.[8] U.S. investments will ramp up in the coming years as recently enacted laws unleash new federal funding that will leverage additional private capital. While China may be out front now, the United States can, and must, close that gap to power America in ways that improve our global

[5] BloombergNEF, "Energy Transition Investment Trends 2023," January 2023.
[6] Tom Wilson, "BP cuts long term forecast for oil and gas demand," *The Financial Times*, January 30, 2023.
[7] Ron Bousso, "Ukraine war to accelerate shift to clean energy, BP says," *Reuters*, January 30, 2023.
[8] BloombergNEF, "Energy Transition Investment Trends 2023," January 2023.

competitiveness, help solve the climate crisis, and strengthen our partnerships with other countries to do the same.

In making the clean energy transition, we also have the opportunity to overcome environmental harms of the past. While the consequences of the climate crisis affect us all, it does not affect us all equally. Increasingly environmental justice is a cornerstone of environmental and climate policies to integrated equity and environmental justice into building a cleaner and more resilient economy. Legislation enacted in the 117th Congress reflected this growing emphasis. In addition, the Biden-Harris Administration is prioritizing environmental justice through the Justice40 Initiative and is taking steps to "narrow the racial wealth gap" by supporting underserved entrepreneurs and small businesses in federal procurement.[9]

Successful energy and climate legislations must meet the tests of cutting climate pollution guided by science, reducing energy costs on families, advancing equity and justice, and creating good, family-sustaining jobs. As this committee takes up energy and climate legislation, Members should evaluate the bills with these metrics in mind as we did at the Select Committee in working with the standing committees in the 116th and 117th Congresses.

Climate and clean energy accomplishments in the 116th and 117th Congresses

During the last four years, Congress has produced legislation to set the United States on the path towards solving the climate crisis by passing policies to significantly cut climate pollution, help our communities adapt to its effects, and make them more resilient to its consequences. These climate and clean energy investments will also advance cleaner, cheaper energy generation that enhances America's energy security and global competitiveness. While the 116th Congress enacted some important legislation, especially the energy-related provisions of the 2020 year-end omnibus legislation, the 117th Congress seized the opportunity for transformational action and passed three pieces of legislation that will guide climate action for the next decade: the Infrastructure Investment and Jobs Act (IIJA), the Inflation Reduction Act (IRA), and the CHIPS and Science Act. All told, these policies will reduce heat-trapping pollution in a way that creates good-paying American jobs, bolsters domestic manufacturing of clean technologies, reduces energy costs for families and businesses, invests in historically disadvantaged communities, and firmly positions the United States to remain the global leader in clean technologies of the 21st century.

The majority staff of the Select Committee on the Climate Crisis summarized the climate and clean energy legislative accomplishments of the 116th and 117th Congresses in the December

[9] The White House, "FACT SHEET: Biden-Harris Administration Advances Equity And Economic Opportunity Through Federal Procurement And State And Local Infrastructure Contracting," July 6, 2022.

2022 majority staff report "Solving the Climate Crisis 2022: Key Accomplishments and Additional Opportunities."[10] Below are brief summaries of four of the bills:

2020 Omnibus

The 2020 year-end omnibus legislation helped advance climate solutions and clean energy research, invested in our nation's resilience, and used America's technological leadership to expand opportunities for all Americans. The legislation included support for energy and environmental innovation, clean energy tax extensions, pipeline safety, and water infrastructure. Notably the legislation directed the Environmental Protection Agency (EPA) to phase down the production and consumption of heat-trapping hydrofluorocarbons (HFCs) which, along with the Senate's ratification of the Kigali Amendment to the Montreal Protocol, will enable the United States to lead global efforts to avoid increasing global temperatures by up to 0.5°C.

Infrastructure Investment and Jobs Act

The 2021 Infrastructure Investment and Jobs Act (IIJA) included historic investments to strengthen our nation's core infrastructure for transportation, water supply, and electric grid resilience and modernization. It also provided major investments in energy efficiency, advanced environmental justice by remediating legacy pollution, and prepared communities for costly weather disasters. These investments include the largest investment ever in public transit, broadband to expand access for low-income American families, clean electric school and transit buses and a nationwide electric vehicle charging network. The IIJA also supported projects to reduce flood and wildfire threats to communities, including strengthening housing, public buildings, and infrastructure against climate-fueled extreme weather.

The CHIPs and Science Act

The CHIPS and Science Act authorized critical investments in American innovation and workforce development by advancing research to expand clean energy, modernize the grid, develop carbon removal and clean industrial technologies, and advance the fields of climate science, clean water systems, and critical minerals. The CHIPS and Science Act also benefits environmental justice communities, with investments to build regional technology hubs, expand grants to economically-distressed communities and labor markets, and diversify the STEM workforce. The investments included for semiconductor chips will support the American-led development of increasingly essential components of electric vehicles, building electrification, renewable energy, and electric transmission technologies.

The Inflation Reduction Act

[10] Select Committee on the Climate Crisis majority staff, "Solving the Climate Crisis 2022: Key Accomplishments and Additional Opportunities," December 2022.

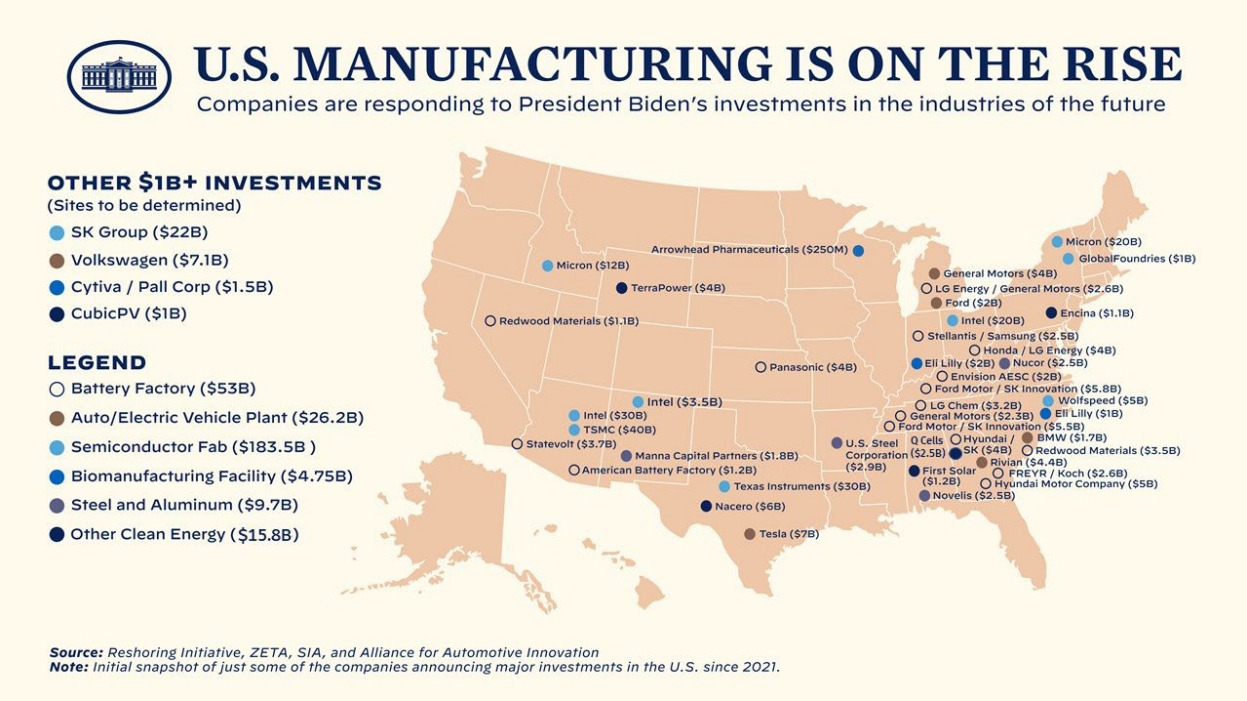
The Inflation Reduction Act (IRA) is the largest climate and clean energy investment in U.S. history, including roughly $370 billion to expand access to cleaner, cheaper energy and cost-saving technologies that will help reduce pollution, boost resilience across America, ensure environmental justice for vulnerable communities, address the national security threats posed by extreme weather, and meet our climate goals. In addition to lowering energy costs and creating jobs, the IRA is expected to help put the nation on a path to reducing harmful carbon pollution by as much as 42% by 2030. The IRA will:

- Deploy cheaper, clean energy faster and support energy efficiency upgrades and clean electrification to American families and businesses to help save money on their energy bills;
- Help deploy cheaper, cleaner vehicles through tax credits for electric vehicles, and enhance transportation resilience, equity, and sustainability;
- Create millions of good-paying jobs, develop the workforce, and promote economic development, along with continued development of strong domestic supply chains for clean energy technologies;
- Reduce climate pollution from our industrial sector and tackle releases of potent heat-trapping pollutants like methane;
- Focus investments into disadvantaged communities to combat environmental injustice and empower communities across the United States to ensure that they share in the benefits of the transition to a clean economy;
- Provide billions of dollars for conservation, restoration, and resilience projects on public and private lands, including working lands, to promote healthy environments that provide clean air and water, food, jobs, and store climate pollutants;
- Strengthen community and infrastructure resilience, including investments to help rural communities and tribes build resilience and adapt to unavoidable climate impacts; increase the resilience and reliability of the electricity grid; improve energy and water efficiency and resilience for affordable housing; and increase the resilience and capacity of coastal and marine habitats to withstand weather events;
- Advance renewable energy development and ensure oil and gas companies pay their fair share for extraction activities on public lands and waters; and
- Bolster advancements in climate and weather research and clean technology innovation.

In addition to the laws summarized above, the 116th and 117th Congresses also took other important conservation, environmental justice, climate and clean energy actions through the enactment of additional legislation, including the Great American Outdoors Act, the American Rescue Plan, and the annual National Defense Authorization Acts and appropriations acts.

The benefits of these climate and clean energy investments are arriving now with more anticipated in the future

By the second anniversary of President Biden's inauguration, companies had announced $300 billion investments in innovative technologies from biomanufacturing to batteries and semiconductors to solar.[11] Since the enactment of the IRA in August 2022, $89.5 billion in clean energy projects alone have been announced, initiating new economic development opportunities across the country.[12] Companies are already responding to the changing U.S. clean energy investment and demand landscape especially for globally competitive technologies like solar, batteries and electric vehicles.[13]



As the initiatives from the IIJA, IRA and CHIPs and Science Act ramp up, these investments and subsequent economic development will continue to grow. Various analyses suggest that additional jobs, health benefits and cost savings will come from the IRA, including the following:

- The BlueGreen Alliance and the University of Massachusetts Amherst Political Economy Research Institute found that the IRA would create more than 9 million good jobs over

[11] Brian Deese, "The Biden Economic Agenda, Two Years In," January 20, 2023.
[12] Personal calculation based on Clean Energy Project Tracker, accessed on January 29, 2023.
[13] Kelsey Tamborrino and Josh Siegel, "Big winners from Biden's climate law: Republicans who voted against it," *Politico*, January 23, 2023.

the next decade in clean energy, manufacturing, and transportation as well as building efficiency, environmental justice and natural infrastructure.[14]

- According to Energy Innovation, the IRA "could lead to between 3,700 to 3,900 avoided deaths in 2030, in addition to 99,000 to 100,000 avoided asthma attacks, and 405,000 to 417,000 avoided lost workdays … As a percentage decrease, avoided deaths are concentrated in communities of color … and on balance, the bill's provisions reduce health burdens more in communities of color."[15]

- The Princeton University-led REPEAT Project found that the IRA would lower annual U.S. energy expenditures overall by at least 4% in 2030, equal to nearly $50 billion per year in savings for households, businesses, and industry.[16] U.S. households in particular would save hundreds of dollars annually on energy costs.

- The Rhodium Group estimated that due to lower electricity rates, lower fuel costs, and greater use of energy efficiency, household energy costs will decline by $717 - $1,146 in 2030, including electricity bills, home heating fuel bills, and transportation fuel costs.[17]

- Resources for the Future (RFF) estimated that the IRA will help reduce retail costs of electricity by 5.2-6.7%, generating aggregate savings of $209 - $278 billion, and helping the average U.S. household save roughly $170 - $220 each year from lower electric bills and lower costs for goods and services over the next decade.[18] RFF expects that the IRA's deflationary impacts on electricity prices will begin quickly – as soon as 2023. RFF also estimated that the IRA will help protect ratepayers from volatility in natural gas prices.

- Rewiring America also published an analysis of the community and household benefits available by congressional district.[19] All 120.7 million households in the United States are eligible for an average of $5,739 in tax credits and an average of $367 in rebates.

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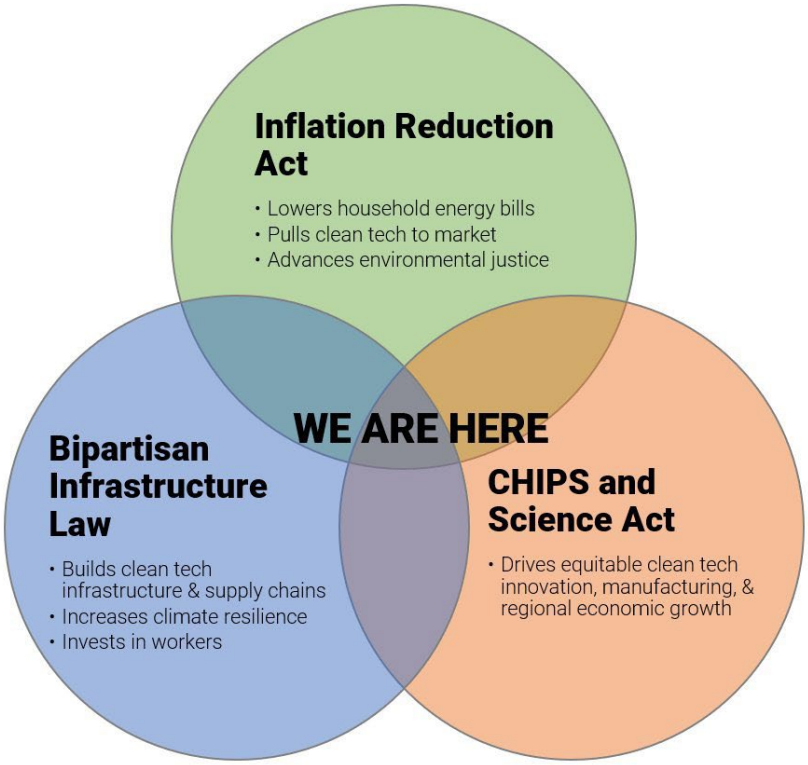
[14] BlueGreen Alliance, 9 million Jobs from Climate Action: The Inflation Reduction Act (Aug. 2022).
[15] Energy Innovation, "Modeling the Inflation Reduction Act Using the Energy Policy Simulator," August 2022.
[16] Jesse Jenkins, Erin Mayfield, Jamil Farbes, Ryan Jones, Neha Patankar, Qingyu Xu, and Greg Schively, Preliminary Report: The Climate and Energy Impacts of the Inflation Reduction Act of 2022, REPEAT Project, (Aug. 4, 2022).
[17] John Larsen, Ben King, Hannah Kolus, Naveen Dasari, Galen Hiltbrand, and Whitney Herndon, A Turning Point for U.S. Climate Progress: Assessing the Climate and Clean Energy Provisions in the Inflation Reduction Act (Rhodium Group, Aug. 12, 2022).
[18] Nicholas Roy, Dallas Burtraw, and Kevin Rennert, Retail Electricity Rates Under the Inflation Reduction Act Of 2022 (Resources for the Future, Aug. 2022).
[19] Rewiring America, The IRA will deliver huge savings: If we maximize its electric potential for our communities and households, September 13, 2022.

Since they have triple the energy burden (the portion of their income spent on home energy) as other households, the 53 million low- and moderate-income households in the United States will greatly benefit from being eligible for an average of $10,377 in rebates through the IRA.

As encouraging as these analyses already are, the ultimate benefits may be even greater as the IRA works in conjunction with the IIJA and the CHIPs and Science Act. The history of past technical change suggests that to enable successful, ongoing innovation, governments must invest in R&D to push development of new technologies and couple those with demand policies to pull them to deployment.[20] The IIJA, the IRA and the CHIPs and Science Act provides this push-pull combination for clean energy as illustrated in this graphic by Dr. Constantine Samaras and America will reap the benefits for years to come.[21]



Solving the climate crisis

Building on the achievements of the 116th and 117th Congresses, there is still more to do to fully address the climate crisis. Foremost is the need for implementation of the legislation that was enacted. This requires concerted effort from the Biden-Harris administration in partnership

[20] Vicki Norberg-Bohm, "Creating Incentives for Environmentally Enhancing Technological Change: Lessons From 30 Years of U.S. Energy Technology Policy," *Technological Forecasting and Social Change*, 2000.
[21] Costa Samaras, available at https://twitter.com/CostaSamaras46/status/1616631930274865152.

with state, local, and tribal governments as well as businesses, investors, civil society and individuals taking advantage of the tax credits and programs that will support energy efficiency and clean energy deployment. In addition, the Biden-Harris administration is developing a number of standards and safeguards that will work in tandem with the recent laws to achieve further climate pollution reductions. These are crucial to meeting the climate and clean energy goals that President Biden has set.

Congress should also consider further appropriations and legislation to drive the transition to a clean energy economy that supports a healthy, resilient and just America. The 2022 Select Committee majority staff report highlighted additional opportunities for future Congresses to address the climate crisis,[22] including the need for:

- A comprehensive transmission strategy to meet the increased electric load from electrification of vehicles, buildings, and industrial processes;
- A Clean Electricity Standard, Zero Emission Vehicle sales standards, and other sector-specific standards to provide certainty for investments in pollution reduction;
- A comprehensive approach to critical minerals sourcing and recycling, including updating outdated mining laws to ensure critical minerals are secured in an environmentally, economically, and socially responsible way;
- Continued investments in research for hard-to-decarbonize sectors like off-road transportation and industry, and for carbon removal;
- Improving community engagement in the permitting process, addressing the cumulative impacts of plastic production and disposal in fenceline communities, and supporting efforts to strengthen the environmental justice focus of agencies;
- Increasing support for workforce development and communities experiencing energy transitions, including through registered apprenticeships and a reimagined Civilian Conservation Corps, and ensuring all workers are protected by securing strong labor standards, especially during any extreme weather conditions or events;
- A National Adaptation and Resilience Plan, including strategies to advance climate science and tools, expand technical assistance to improve planning and access to federal programs, and prioritize investments in environmental justice communities;
- Advancing resilience-based codes and standards against rising flood, wildfire, and extreme weather risks, and accelerating disaster recovery and bridging the resilience and protection gap for communities at greatest risk;

[22] Select Committee on the Climate Crisis, "Select Committee Democrats Release Final Report on Key Accomplishments, Additional Opportunities," December 14, 2022.

- Implementing nature-based solutions on public, private, and working lands and waters, enshrining climate mitigation and adaptation in federal natural resource and land management, and protecting and conserving at least 30% of lands and waters;
- Increasing research on climate and public health impacts, prioritizing health equity in federal planning for climate impacts on the healthcare sector and public health, recognizing the disproportionate burden on disadvantaged communities; and ensuring all health sector infrastructure is resilient to the impacts of climate change;
- Fulfilling our commitments to mobilize climate finance for developing countries, and expanding diplomatic, humanitarian, and military capacity to address climate issues; and
- Embedding climate considerations into all facets of national security and defense policy, including acquisitions, vehicles, technologies, construction, and other approaches.