

Building Climate Resilience: DoD Climate Adaptation and Mitigation Strategies

Innovations in Climate Resilience (ICR23)



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Bottom Line Up Front (BLUF)

- We need to build climate resilience today for a better tomorrow.
- Climate change is impacting DoD operations today.
- Action is needed now to mitigate and adapt:
 - Policy and strategy
 - Science and technology innovation
 - Data-driven decision-making
 - Actionable science
- Efforts to reduce impacts of climate change are imperative for DoD mission success in changing environments.



DoD is Experiencing Climate Effects Now

We Must Accelerate Adaptation Efforts and Make “Hard Choices” Today



Operations:

- Increased global insecurity – “Failed States”
- Defense Support to Civil Authorities- “Fire Year” instead of “Fire Season”
- International Humanitarian Response



Installations and Infrastructure

- Drought, floods, heat
- Loss of access to training areas
- Degraded infrastructure



People and Equipment

- Heat stress and health impacts
- Readiness effects
- Performance degradation

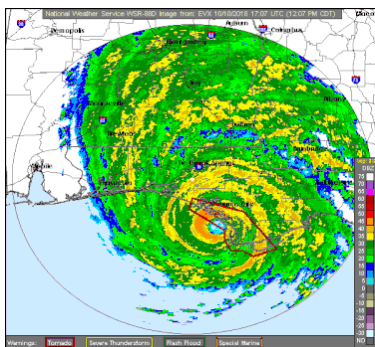


Two Responses to Climate: Adaptation & Mitigation

DEPARTMENT RESPONSES

1

ADAPTATION



Manage unavoidable climate impacts
by adapting, changing mission, and/or
relocating where appropriate

2

MITIGATION



Avoid unmanageable impacts
through rapid greenhouse gas (GHG)
reduction



Statutory Requirements

Operational Energy

UNITED STATES CODE U.S.C

- 10 USC 2911(a), Energy Policy
- 10 USC 2911 note, Consideration of Fuel Logistics Support Rqmts in Planning, Rqmts, Dev, and Acq Process
- 10 USC 2912, Availability and use of energy cost savings
- 10 USC 2922(h), Limitation on procurement of drop-in fuels
- 10 USC 2626(a), Operational Energy Policy
- 10 USC 2926(b), Responsibilities of the SecDef
- 10 USC 2926(c), Functions of the ASD(EI&E)
- 10 USC 2926(d), Contested Logistics Working Group
- 10 USC 2926(e), Operational Energy Strategy
- FY2022 NDAA, Sec 352, Global bulk fuel management and delivery.

Executive Orders (EO)

- Executive Order 13972, Promoting Small Modular Reactors for National Defense and Space Exploration, January 14, 2021
- Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021
- Executive Order 14017, America's Supply Chains, February 24, 2021
- Executive Order 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability, December 08, 2021

Sustainability

UNITED STATES CODE U.S.C

- 10 USC 2391, Military base reuse studies and community planning assistance
- 10 USC 2684, Cooperative agreements for management of cultural resources
- 10 USC 2802, Military construction projects
- 10 USC 2864, Master plans for major military installations
- FY2020 NDAA, Sec 331, Agreements to Share Monitoring Data Relating to Perfluoroalkyl and Polyfluoroalkyl Substances and Other Contaminants of Concern
- FY2021 NDAA, Subtitle E (Sec 281-267), Sustainable Chemistry
- FY2021 NDAA, Sec 333, Restriction on Department of Defense Procurement of Certain Items Containing Perfluorooctane Sulfonate or Perfluorooctanoic Acid
- FY2021 NDAA, Sec 334, Sustainable Alternatives to Aqueous Film-Forming Foam
- FY2022 NDAA, Subtitle D (Sec 341-349), Treatment of Perfluoroalkyl Substances and Polyfluoroalkyl Substances
- FY2022 NDAA, Sec 323, Plan to reduce Greenhouse Gas Emissions

Executive Order (EO)

- Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, January 20, 2021
- Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, January 20, 2021
- Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021
- Executive Order 14017, America's Supply Chains, February 24, 2021
- Executive Order 14030, Climate-Related Financial Risk, May 20, 2021
- Executive Order 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability, December 08, 2021
- Executive Order 14072, Strengthening the Nation's Forests, Communities, and Local Economies, April 22, 2022

Water Resilience

UNITED STATES CODE U.S.C

- 33 USC 1251, Congressional Declaration of Goals and Policy
- 42 USC 300g-1, National Drinking Water Regulations
- 42 USC 8253, Energy and Water Management Requirements
- 10 USC 2925, Annual Department of Defense Energy Management Report
- 42 USC 262a, Enhanced Control of Dangerous Biological Agents and Toxins
- 10 USC 2866, Water Conservation at Military Installations

CODE OF FEDERAL REGULATION (CFR)

- 40 CFR §141.401, Sanitary Surveys for Groundwater Systems,

Executive Order (EO)

- Executive Order 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability, December 8, 2021

Climate Change

UNITED STATES CODE U.S.C

- National Defense Authorization Acts (NDAA) FY21 & FY22
- 10 USC 2391, Military base reuse studies and community planning assistance
- 10 USC 2684, Cooperative agreements for management of cultural resources
- 10 USC 2802, Military construction projects
- 10 USC 2815, Military installation resilience projects
- 10 USC 2864, Master plans for major military installations
- 10 USC 2866, Water conservation at military installations
- 10 USC 2911, Energy policy of the Department of Defense

Executive Order (EO)

- Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, January 20, 2021
- Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021
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Executive Orders (EO)

- Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, January 20, 2021

Installation Energy

UNITED STATES CODE U.S.C

- 10 USC 101, Definitions
- 10 USC 2662, Real property transactions
- 10 USC 2667, Leases
- 10 USC 2668, Easements
- 10 USC 2679, Installation support services
- 10 USC 2686, Utilities and services
- 10 USC 2688, Utility systems
- 10 USC 2802, Military construction projects
- 10 USC 2805, Unspecified minor construction projects
- 10 USC 2807, Architectural and engineering services and construction design
- 10 USC 2867, Energy monitoring and utility control system specification
- 10 USC 2872, Utilities and services
- 10 USC 2911, Energy policy of the Department of Defense
- 10 USC 2912, Availability and use of energy cost savings
- 10 USC 2913, Energy savings contracts and activities
- 10 USC 2914, Energy resilience and conservation construction projects
- 10 USC 2915, Facilities – renewables
- 10 USC 2916, Sale of electricity from alternate energy and cogeneration
- 10 USC 2917, Development of geothermal
- 10 USC 2918, Fuel sources for heating systems
- 10 USC 2919, DoD participation in programs for management of energy

UNITED STATES CODE U.S.C

- 10 USC 2920, Requirements for availability of energy for critical missions; black start exercises.
- 10 USC 2922, Liquid fuels & natural gas
- 10 USC 2925, Annual DoD Energy Management Reports
- 40 USC 501, Contract for public utility
- 42 USC 6835, Energy efficiency slds
- 42 USC 6935, Federal compliance requirements
- 42 USC 8253, Energy management requirements
- 42 USC 8256, Incentives for agencies
- 42 USC 8257, Interagency energy management task force
- 42 USC 8258, Reports
- 42 USC 8259, 8262, Definitions
- 42 USC 8287, Authority to enter into contracts
- 42 USC 15852, Renewable energy use requirement
- 42 USC 17091, Energy star requirement
- 42 USC 17112, Data center efficiency

Executive Order (EO)

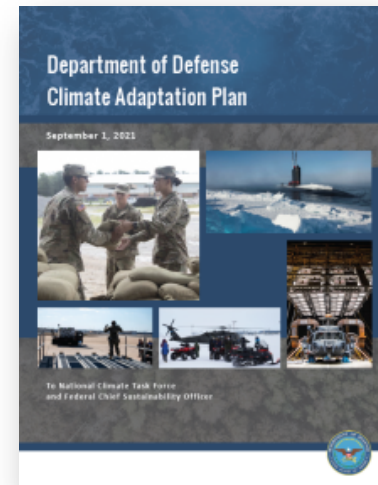
- Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021
- Executive Order 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability, December 08, 2021



DoD Climate Adaptation Plan (CAP)

Topline Messages:

- Climate change is a serious threat to our security. It impacts our missions, plans, and capabilities and must be met by ambitious, immediate action.
- The Department is responding to climate change in two ways: adaptation to enhance resilience to the effects of climate change; and mitigation to reduce greenhouse gas (GHG) emissions.
- The Department is showcasing its bold steps with its CAP, which is intended to drive transformative change across the entire Department.



<https://www.defense.gov/spotlights/tackling-the-climate-crisis/>



CAP Strategic Framework

5 LINES OF EFFORT (LOEs) reflect the scope and scale of DOD's adaptation and resilience efforts:



LOE 1: CLIMATE-INFORMED DECISION-MAKING



LOE 2: TRAIN AND EQUIP A CLIMATE-READY FORCE



LOE 4: SUPPLY CHAIN RESILIENCE AND INNOVATION

4 ENABLERS crosscut all five Lines of Effort:



Continuous Monitoring Data Analytics



Aligning Incentives to Reward Innovation



Climate Literacy



Environmental Justice

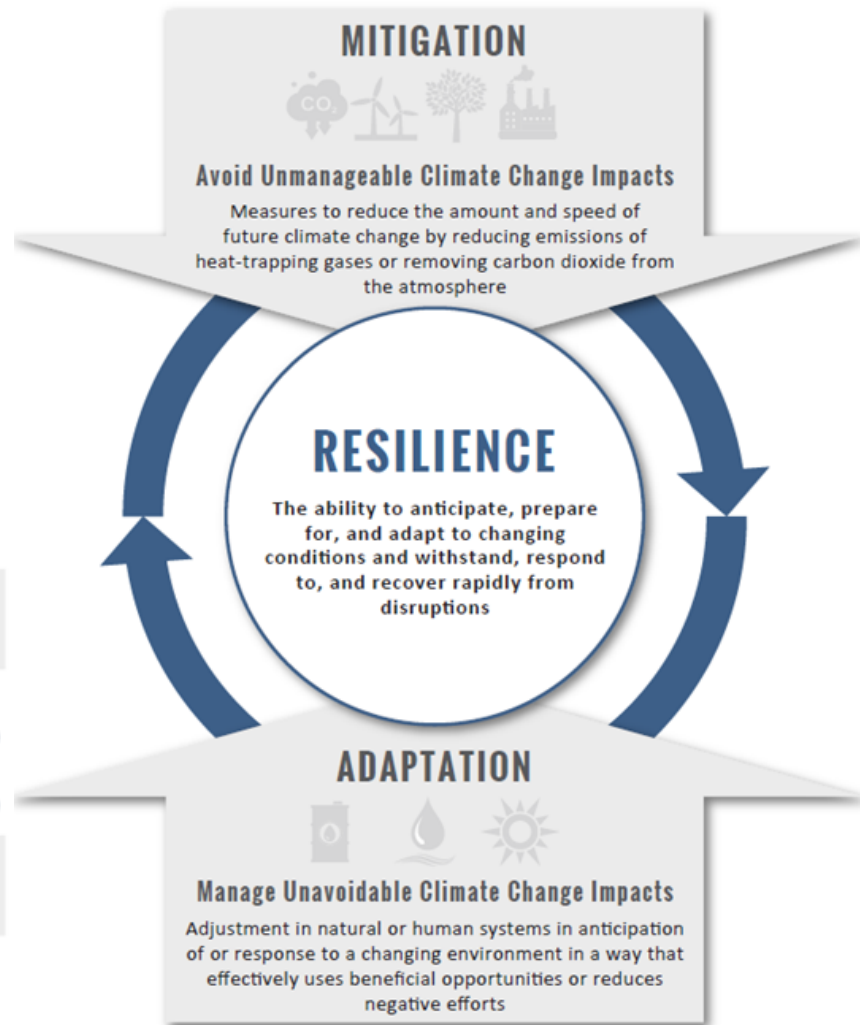


LOE 3: RESILIENT BUILT AND NATURAL INFRASTRUCTURE



LOE 5: ENHANCE ADAPTATION AND RESILIENCE THROUGH COLLABORATION

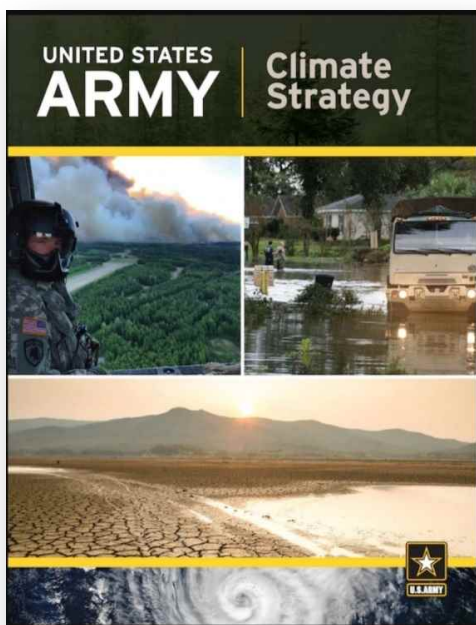
END STATE: The above five Lines of Effort and four enablers are to ensure that DOD can operate under changing climate conditions, preserving operational capability and enhancing the natural and man-made systems essential to the Department's success.



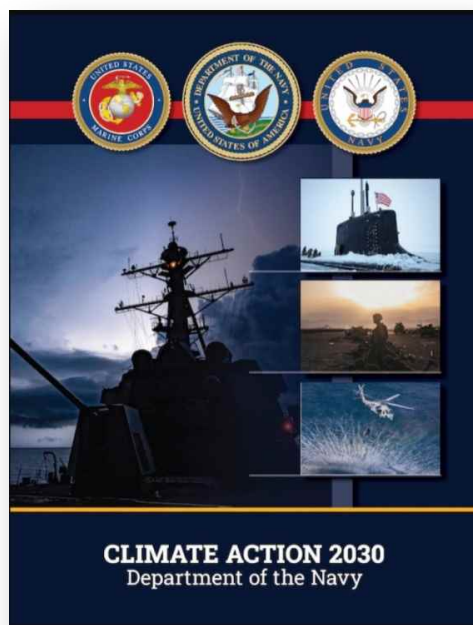


DoD Service Climate Plans

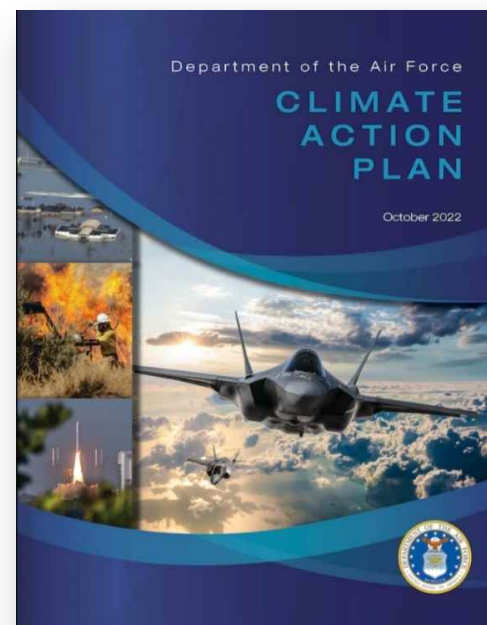
Military Services are taking bold steps to accelerate climate adaptation



United States Army
Climate Strategy



Department of the Navy
Climate Action 2030



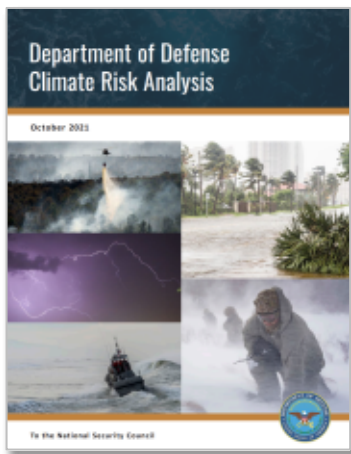
Department of the Air Force
Climate Action Plan

<https://www.defense.gov/spotlights/tackling-the-climate-crisis/>



National Security Frameworks

Incorporating climate change security implications across relevant DOD strategy, planning, and programming documents and processes.



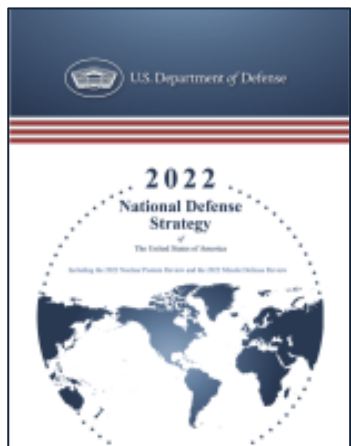
Department of Defense Climate Risk Analysis (DCRA) (2021)

- The DoD will play a key role in many security scenarios which will be influenced by climate change.
- Climate poses direct and compounding risks across a variety of sectors and regions.
- Climate will be incorporated into relevant strategy, planning, and processes through DoD.

National Defense Strategy (NDS) (2022)

- Impacts of climate change:
 - Affect basing and access while degrading readiness, installations, and capabilities.
 - Increasing temperatures
 - Changing precipitation patterns
 - Rising sea levels
 - More frequent extreme weather conditions
 - Increase demands, including on the Joint Force, for disaster response and defense support of civil authorities
 - Affect security relationships with some allies and partners.

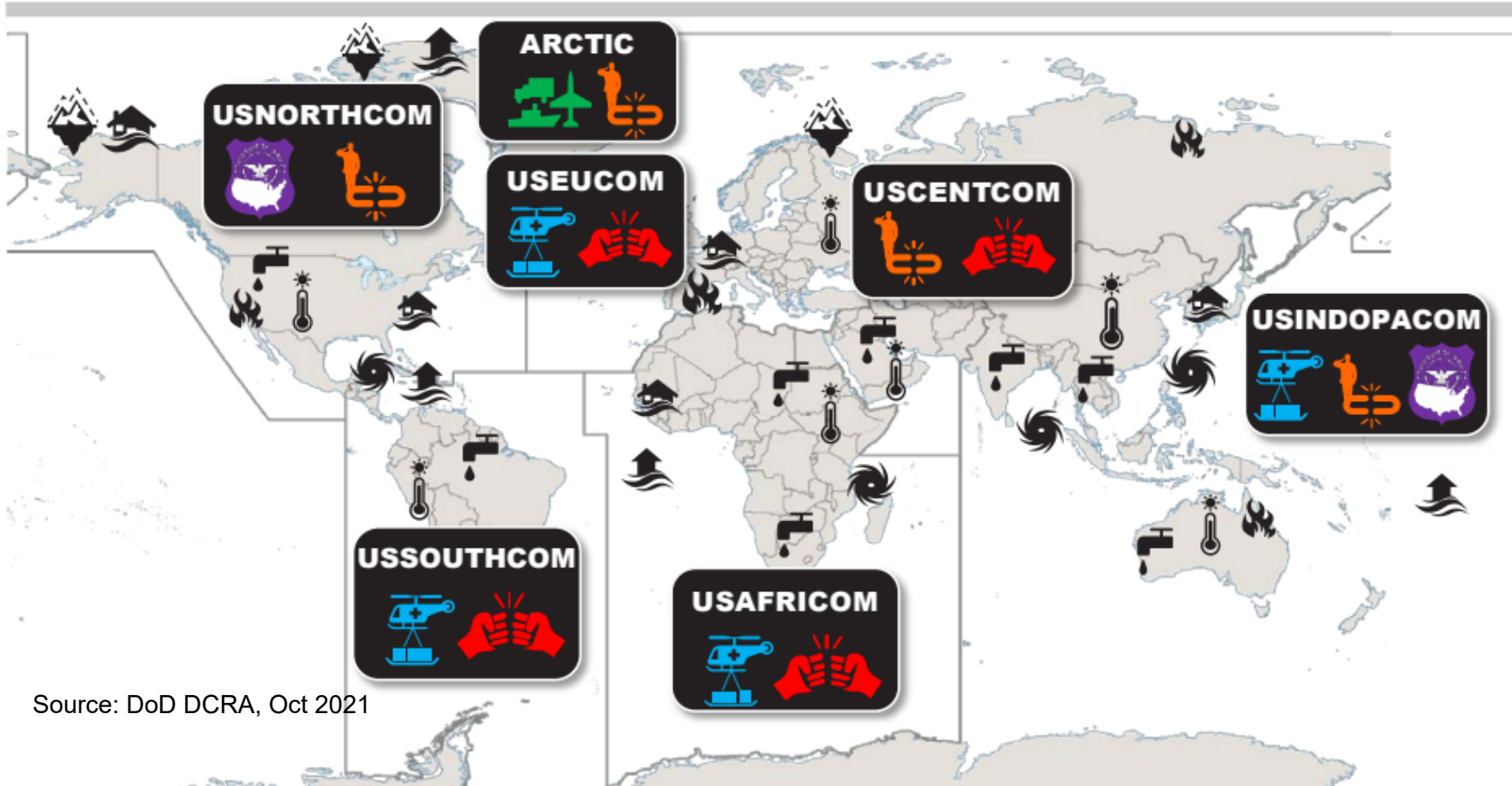
<https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF>



<https://media.defense.gov/2021/Oct/21/2002877353/-1/-1/0/DOD-CLIMATE-RISK-ANALYSIS-FINAL.PDF>



DCRA: Representative Climate Change Hazards / Potential Impacts on DoD Missions



Source: DoD DCRA, Oct 2021

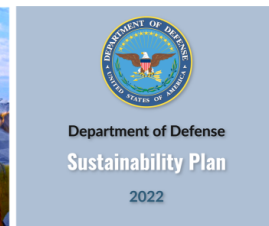
- Increased demand for defense support of civil authorities (DSCA).
- Increased demand for humanitarian assistance and disasterresponse (HADR) overseas.
- Transport, communication, and monitoring capabilities to operate in harsh environment.
- Altered, limited, or constrained environment for military operations.
- Instability within and among other nations.



DoD Sustainability Report and Implementation Plan

– Priority Actions in FY 2022 and Progress Examples:

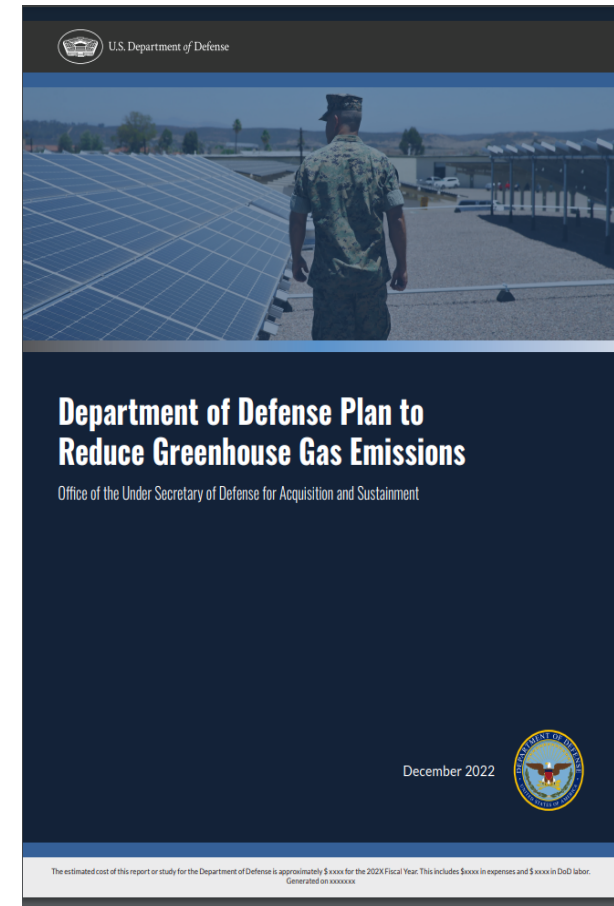
- 100% Carbon Pollution-Free Electricity (CFE)
- 100% Zero-Emission Vehicle (ZEV) Fleet Acquisitions
- Net-Zero Emissions Buildings, Campuses, and Installations
- Reducing Waste and Pollution
- Sustainable Procurement
- Climate and Sustainability Focused Federal Workforce
- Incorporating Environmental Justice
- Accelerating Progress through Partnerships





DoD Plan to Reduce Greenhouse Gas (GHG) Emissions *(draft)*

- The direction of science and policy is clear: the United States, as a nation, must achieve net-zero GHG emissions by or before 2045 to avoid the most adverse consequences of climate change.
- These consequences include a world that is less stable and more prone to conflict, with more common natural disasters and extreme weather events that can degrade military capability or increase requests for Defense Support to Civil Authorities
- This plan complements previous reports:
 - Climate Change Adaptation Plan
 - Sustainability Report and Implementation Plan
 - Securing Defense-Critical Supply Chains





Key Takeaways

- DoD has produced numerous strategy and framework documents outlining approaches to climate mitigation and adaptation.
- These documents are now being incorporated into policy.
- Policy implementation guidance to follow.
- Continued innovations in RDT&E are necessary to achieve mitigation and adaptation goals.



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Backup



Climate Change Reports and Guidance

- [Department of Defense Climate Adaptation Plan \(DoD CAP\)](#)
- [Highlights and Examples Department of Defense Climate Adaptation Plan](#)
- [Department of Defense Climate Risk Analysis \(UNCLASS\)](#)
- [DoD Installation Exposure to Climate Change at Home and Abroad](#)
- [Report on Effects of a Changing Climate to the Department of Defense, January 10, 2019](#)
- [Department of Defense 2014 Climate Change Adaptation Roadmap](#)
- [Climate Adaptation for DoD Natural Resource Managers: A Guide to Incorporating Climate Considerations into Integrated Resource Management Plans](#)
- [Department of Defense Climate-Related Risk to DoD Infrastructure Initial Vulnerability Assessment Survey \(SLVAS\) Report](#)