Net-Zero Planning by Militaries Across the Globe
Summary of Findings

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This document presents a summary of research related to commitments and plans to reach net zero emissions by militaries across the globe including findings, general trends, exceptions and countries with especially different strategies or timelines. The findings are followed by a table showing goals and strategies (when available) for 11 countries, including the U.S.

Status of Net Zero Emissions for the U.S. Military
To comply with recent Executive Orders and goals set out for the Department of Defense (DOD) and the DON, all US Federal agencies are being called into action. In January 2021, Executive Order 14008 called for a government-wide approach for meeting climate related challenges in the U.S. and set goals for agencies. In December 2021, Executive Order 14057 set the specific goal of net zero emissions from overall federal operations, including DOD, by 2050 and a 65 percent emissions reduction by 2030. The NPS Pathways to Net Zero report is a broad study of strategies for the Department of the Navy (DON) to achieve net zero emissions by 2050. Across DOD, all branches have issued climate strategies including climate action goals and strategies.

General trends
Most EU, NATO and other allied countries have goals to become net zero by 2050 with public policies and statements showing a reliance on a combination of technologies and other strategies to reach the goal. There is little public documentation in many of these countries on military specific goals and technology strategies, but it is expected that a state's military is responsible to follow the government-wide efforts towards net zero, though there may be lag in implementation due to hard-to-decarbonize sectors. In general, most policies emphasize transferring ground installations and industry to net zero, via renewable energy and clean manufacturing. Little emphasis is placed on operational energy within the sea and air domain. While it is a significant source of military emissions in the U.S. military, in countries without large navies or air forces, it represents a very small part of total emissions. Some trends across allied countries can be observed and most countries are embracing net zero strategies like those under consideration and use in the U.S.

Installation and shore-based power
The push for installations is to transition to fully renewable power over time, by some combination of wind and solar depending on geography. For example, Britain is embracing wind while Australia is planning to rely more heavily on solar. Other trends include a push towards lower carbon manufacturing, renewable and recyclable products.

Operational energy
For most countries, the largest factor in operational energy is the ground transportation domain. Virtually all the countries researched focus on EVs of various sorts to achieve net zero for these transport sectors.

For many countries, sea and air domains account for very little of the overall emissions and are often not addressed at length within documentation of net zero goals and pathways to those goals. However, sea-based transport is projected to adapt to some combination of alternative fuels, hydrogen, and ammonia power. In many cases, it is projected that offsets will be required by carbon capture or sequestration to fully account for sea domain emissions. For the air domain, most countries rely heavily on low-carbon drop-in replacement fuels and carbon offsets in pursuit of reaching net zero. There is some limited interest in hydrogen powered aircraft in the long term and electric powered aircraft for shorter range flight applications, but hydrogen aircraft technologies still require significant development to be viable and scale up, and electric aircraft are limited in range.

Notable country-based exceptions

India

In part due to India's developing state, it is lagging behind most other countries in net zero goals. In 2022, the Indian prime minister announced a 2070 goal for net zero. This goal may be subject to change as India continues to develop, but it is possible there will be a time window of compatibility issues for international interoperability while Indian forces continue to use fossil fuel-based energy after other countries have transitioned.

China and Russia

Neither China nor Russia have shown intention, at least publicly, to reach net zero. China has a goal to be net zero by 2060, but research shows little supporting information or action. Russia has been inconsistent with both goals and any policies showing intent.

Conclusion

While many countries have set net zero goals, pathways and technologies to net zero vary and funding is being used to develop potential green energy solutions across the board. There is widespread development and interest in renewable electrical energy and storage, alternative fuels for hard-to-decarbonize industries, and hydrogen power, both in the generation of green hydrogen and its use. Many countries have very little military-specific information on reaching net zero; this may be because the militaries in question are relatively small, both in total size and in percentage of a country's emission portfolio.

Summary Table

Country	Net Zero Goal Year	Military specific goals or policy documents?	Main Strategies	Notes
United States	2050	Yes	Differs by branch	• Widespread investment across services, with many different technological paths • Trends with technological investment show focus on installation decarbonization with renewables, electric vehicles, and alternative fuels • Investment in hydrogen, microgrids, improved logistics and many other climate strategies/technologies continues within specific commands and programs in each service • DOD: Tackling the Climate Crisis
Australia	2050	Yes, minimal	Solar, hydrogen	• Very little military-specific information; military sources are considered small in terms of total emissions • Mostly focused on grid and installation measures • Aviation still a stumbling block, Fischer-Tropsch fuels are noted as a possible alternative • Focus on hydrogen on a national level • Australia's Long - Term Emissions Reduction Plan • Australia's Bioenergy Roadmap • Defending Australia in the Asia Pacific Century
Canada	2050	Yes	Renewables for installations, EVs	• Focuses on reducing installation carbon footprint. Little information available regarding energy for aviation and marine operations • While EVs are looked to as a replacement for light vehicle fleets, decarbonizing sea, air and armored land platforms is not addressed in depth • Defence Energy and Environment Strategy • Canada Emissions on Climate Action Tracker
China	2060	None found	None found	• Lacking detail on plans to reach net zero by 2060 • Emissions from China still increasing every year • China Country Summary • China's Pledge to Be Carbon Neutral • As Climate Change Threatens China, PLA Is Missing in Action

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Germany	2050	None found	Renewables, carbon neutral fuels	• No specific military policy relating to net zero goals • National focus on carbon neutral fuels for transport industry • Assumption is that the defense ministry will follow the country's net zero goals • Germany's current climate action status
India	2070	Sparse	None found	• Broad goals on the military level to reduce emissions, but no specific plans • Currently highly reliant on carbon-based fuels • India Country Summary • Approval of National Mission for a Green India Scheme
Italy	2050	None found	Renewables	• Following EU guidelines, focused on renewable measures • Biofuels looked to for hard to decarbonize industries • Integrated National Energy and Climate Plan • EU Country Summary
Japan	2050	None found	Hydrogen, ammonia, alternative fuels	• Planning to reach net zero by solar, wind and electrification for most industries • For sea-power, focus is on hydrogen and ammonia-fueled ships • For air power, focus is on biojet fuel and e-fuel, with some electrification and hydrogen augmentation • Close coordination with the U.S. • Japan's Roadmap to "Beyond-Zero" Carbon • FACT SHEET: U.S.- Japan Climate Partnership
Norway	2050	None found	CCS, hydrogen	• Electrical grid almost completely renewable • Nearly on track to hit net zero by 2050 • Heavy investment in CCS and Hydrogen • Future plan is focused on hard-to-decarbonize sectors • Nothing specific on military emissions • Norway 2022 - Energy Policy Review • Norway's Climate Action Plan for 2021–2030

Country	Net Zero Goal Year	Military specific goals or policy documents?	Main Strategies	Notes
Russia	2060	None found	None found	• Publicly available documents show no serious commitment to reduce emissions • Economically dependent on fossil fuel exports • Russian Federation Country Summary
United Kingdom	2050	Yes	Alternative fuels, hydrogen	• Focuses on EV ground and rail vehicles • Many other widely defined goals • For aviation: current focus on drop-in replacement(alternative) fuels for aircraft and offsetting carbon emissions • Long term heavy use of green hydrogen • For sea travel, both hydrogen and ammonia are considered, with ammonia as a more storage-friendly alternative to hydrogen • Sixth Carbon Budget - Key Recommendations • Defence outlines greener future • Ministry of Defence Climate Change and Sustainability Strategic Approach