

Interrelations, Interdependencies and Constraints of Energy, Climate and Security in the 21st Century

The energy-climate-security nexus is an emergent framework that captures the intricate and interdependent relationships between environmental resources, energy systems, climate change, and security dynamics. The academic and public understanding of the linkages and interdependencies between climate change, energy security, and national security has grown tremendously in the last decade. However, though the two-nodes nexuses of climate change and security as well as energy and climate change and energy and security have been part of the academic and political discussion for quite some time, the multi-nodes nexus of energy-climate-security is rather new.

The nexus approach

The nexus framework gained prominence in 2011 with the consideration of the water, energy, and food security nexus. Indeed, the nexus approach is primarily used in resource management, environmental resources, and sustainability. It is based on the understanding that environmental resources are inextricably intertwined and mutually dependent. This approach emphasizes viewing these elements as part of a complex, interconnected system rather than as isolated components. A key principle is that nexus solutions should benefit more than one sector simultaneously. This conceptual approach helps to better understand, describe, and address complex interrelations, anticipating

potential trade-offs, synergies, and interrelations to design and prioritize better solutions.

By mapping and identifying critical linkages, the nexus approach aims to find mutually beneficial solutions. This includes two-nodes or multi-nodes nexuses, such as energy and climate change, climate change and security, energy and security or the energy-climate-security nexus. Despite its potential, there are challenges in moving from academic debate to practical governance. These challenges include the need for cross-sectoral, multi-dimensional collaboration, managing complexity, and overcoming the potential incompatibility of current structures.

Two-Nodes Nexuses: Energy, Climate Change and Security

The two-nodes nexus, such as energy and climate security, exemplifies the threats climate change poses to energy systems, including reduced electricity generation capacity, water scarcity affecting thermal and hydropower plants as well as future hydrogen production, and the need for infrastructural resilience against extreme weather events. The interdependence of energy security and defence is highlighted by the EU's response to the energy crisis exacerbated by geopolitical conflicts, following the Russian invasion of Ukraine. The EU's

Initiatives like the IEA's Nexus Forum and the EU's policy goals of pursuing energy security and mitigating climate change illustrate the intertwined objectives and the need for comprehensive strategies that incorporate climate considerations into energy planning.

initiatives like Repower EU and Fit for 55 aim to balance energy security with climate goals, reflecting the broader strategic imperative to reduce reliance on fossil fuels and enhance renewable energy

capacity. At the same time the interrelations of energy and security are highlighted regarding the resilience of critical infrastructure, in face of the sabotage of the NordStream pipelines in the Baltic Sea. Ukraine's potential role in this transition, given its rebuilding prospects post-conflict, underscores the geopolitical and economic dimensions of the nexus.

The climate-security nexus recognizes climate change as a risk multiplier that exacerbates

existing vulnerabilities, leading to displacement, social unrest, and conflicts. The EU's integration of the climate, peace, and security nexus into its external policies and NATO's Climate Change and Security Action Plan further illustrate the growing acknowledgment of climate change's security implications. These initiatives aim to enhance awareness, promote adaptation, reduce emissions, and foster collaboration with other actors in the climate security space.

Multi-Nodes-Nexus: Towards Energy-Climate-Security Nexus

One of the first comprehensive study addressing the climate change, energy, and security (defence) nexus in 2023 underscores the vulnerability of defence-related critical energy infrastructure to climate impacts. This study, part of the EU's Strategic Compass for Security and Defence, provides concrete recommendations for defence decision-makers on climate change mitigation and adaptation, aiming to enhance climate resilience while contributing to climate neutrality. These and other studies that recognise the multi-node nexus of energy-climate security are certainly to be welcomed. In view of the ongoing geopolitical effects following the Russian war of aggression in Ukraine, but also the continuing progress of climate change and the challenges of global, regional, and national energy

transformations, it seems beneficial to find joint, cross-sectoral solutions.

It becomes obvious that the energy-climate-security nexus requires a multi- and interdisciplinary approach to address the complex interrelations and develop mutually beneficial responses. However, the application of the nexus approach to the relationship between energy, climate change and security is still in its infancy. As part of its research at IKEM and the IFZO at the University of Greifswald, a team of interdisciplinary researchers is investigating the energy-climate-security nexus. Findings from this research will be presented and discussed together with other scientists, practitioners, and stakeholders at a side event during COP 29 in Azerbaijan.

Kontakt

Prof. Dr. Michael Rodi
michael.rod@ikem.de

Dr. Michael Kalis
michael.kalis@ikem.de



**Institut für Klimaschutz,
Energie und Mobilität e.V.**

Magazinstraße 15-16
10179 Berlin

+49 (0)30 408 1870 10
info@ikem.de

www.ikem.de