

Geopolitical Risks and the Green Energy Transition: Implications for Energy Security, Legitimacy, and Sustainable Development

Israel Shuramu Aga

Norwegian University of Science and Technology (NTNU), Trondheim, Norway

Abstract

The paper examines how contemporary geopolitical tensions shape the green energy transition through social, political, and institutional dynamics rather than purely economic mechanisms. Focusing on the Russia—Ukraine war and the Iran conflict as critical geopolitical shocks, the study explores how disruptions to energy systems are translated into policy responses, public narratives, and questions of justice and legitimacy. Drawing on contemporary policy analysis, international reports, and emerging interdisciplinary literature, the paper adopts a comparative study approach to analyze how states and societies respond to energy insecurity. It develops a conceptual framework linking geopolitical risks to three interrelated dimensions: (1) **energy security and sovereignty**, where governments seek to reduce dependency on external actors through renewable energy expansion; (2), **social legitimacy and public support**, where rising energy costs and security narratives influence citizen attitudes toward the transition; and (3) **environmental justice and distributional outcomes**, where the burdens and benefits of rapid transition policies are unevenly distributed across regions and social groups. The analysis suggests that geopolitical shocks can both accelerate renewable energy adoption—by strengthening security driven policy commitments—and generate social tensions when affordability and fairness concerns are not adequately addressed. The paper contributes to debates on sustainable development by demonstrating that the success of the green transition depends not only on technological changes, but also on governance, institutional capacity, and public trust. It concludes that resilient energy transitions require integrating energy security with social justice and inclusive policy designs, particularly in an era of recurring geopolitical instability.

Keywords: dependency; energy governance; environmental justice; geopolitical instability; green technologies