

Technological Dynamics and Social Change for a Carbon-Neutral Future: Navigating Geopolitics and Inequality to Achieve a Safe and Just Transition

The quest for a carbon-neutral future is no longer unfolding in a stable world. It is shaped by accelerating geopolitical fragmentation, shifting power balances, and growing security concerns that have pushed climate action to the margins of political priorities. Yet these same dynamics expose the fragility of current development models and underscore the risks of delaying decisive action. Climate policy is not a competing agenda—it is central to economic resilience, social stability, and long-term security in Europe and globally.

At the same time, inequality is widening within and between societies. Even in Europe, one of the world's richest regions, disparities in income, wealth, and opportunity are growing, eroding social cohesion and public trust. This social divide coincides with a mounting ecological crisis: climate change, biodiversity loss, and the degradation of vital ecosystems are driving the Earth system toward critical tipping points, threatening the foundations of prosperity, from food and water to energy and health.

Responding to these cascading crises requires more than incremental change. It demands a deliberate tipping of human systems—technological, economic, and social—toward development pathways that secure human well-being within planetary boundaries. Central to this transformation is a shift from resource-intensive growth toward sufficiency, efficiency, and fairness, ensuring decent lives for all while decisively reducing overconsumption by a small, wealthy minority.

Energy system transformation and carbon neutrality are pivotal levers of this transformation. While the scale of needed decarbonization is unprecedented—encompassing demand-side transformation, rapid deployment of renewables and nuclear energy, major efficiency gains, and changes in lifestyles—it offers a unique opportunity to align climate action with energy security, affordability, and social inclusion. After more than a decade of insufficient progress, the Paris Agreement and the 2030 Agenda must be treated not as aspirational ideals but as guiding frameworks for concrete policy choices.

As climate overshoot becomes increasingly likely, the defining challenge of the coming decades will be to minimize its magnitude and duration while accelerating the transformation toward a safe, just, and prosperous future. The choices made in Europe today will not only determine its own trajectory but will also help shape global possibilities for a carbon-neutral world for the benefit of all.