

The Energy Quadrilemma: Integrating Ethics into the Energy Trilemma Framework

Adonis Yatchew

University of Toronto, Toronto, Canada

Extended Abstract

[Download file](#)

Abstract Summary

The Energy Quadrilemma: Integrating Ethics into the Energy Trilemma Framework

Variants of the energy trilemma — *Security, Economics, and Environment* — have long provided a durable analytical lens for energy policymakers and researchers. This paper argues that ethical considerations cannot be adequately subsumed within the trilemma's existing pillars, and that their omission produces systematic blind spots in both policy design and scholarly analysis. We propose expanding the trilemma to an Energy Quadrilemma by introducing Ethics as a fourth element, structured along two analytically distinct streams.

The first, Domestic Ethics, addresses distributional justice (who bears transition costs and benefits across income groups, geographies, and generations), procedural justice (the legitimacy and inclusivity of energy governance), and rights-based obligations (considering energy access as a fundamental human right). The second, Geoeconomic and Geopolitical Ethics, addresses the moral consequences of energy trade relationships. Sustained dependence on authoritarian suppliers that undermine democracies can finance autocratic regimes, fund military adventurism, and impede democratization. This stream also encompasses governance and labor rights conditions embedded in critical mineral supply chains.

The quadrilemma framework generates six tension dyads, three of which are structurally under-addressed by the trilemma. The domestic stream reveals that transition cost burdens are systematically regressive. The geoeconomic stream exposes a category of policy failure the trilemma cannot see: its silence on the political character of energy suppliers is not a minor omission — it is a structural blind spot. A trilemma that ignores ethics does not merely omit a value — it silently encodes one.

Presenting Author Biography

Adonis Yatchew's research focuses on energy, regulation and econometrics. Since completing his Ph.D. at Harvard University, he has taught at the University of Toronto. He has also held visiting appointments at Trinity College, Cambridge and the University of Chicago, among others. He has written a graduate level text on semiparametric regression techniques published by Cambridge University Press. He has served in various editorial capacities at *The Energy Journal* since 1995 and was Editor-in-Chief from 2006 to 2023. He has advised regulators, public and private sector companies for over 35 years and has provided testimony in numerous regulatory and litigation procedures.