

Law, Complexity and Energy Transitions: Building Resilient Pathways for the Future

Energy transitions unfold within complex systems, where infrastructures, markets, institutions, and societies are deeply interdependent. Law is not an external framework applied from above, but an integral component of these systems: it structures interactions, allocates risks and benefits, and orients choices under uncertainty. Yet, traditional legal tools often struggle to cope with the non-linear dynamics and multi-level governance challenges that define today's energy landscape.

This talk explores how law can both enable and constrain resilience in energy transitions. It examines three key dimensions: resilience in the face of systemic shocks (security of supply, variability of renewables, critical resources); justice and intergenerational equity as guiding principles of the energy transition; and polycentric governance as a response to the complexity of energy markets and communities.

By highlighting examples from European and international climate and energy law — including renewable energy communities, hydrogen projects, and critical resource governance — the presentation argues for a reconceptualization of legal frameworks that embraces flexibility, fosters cooperation across scales, and embeds resilience as a legal and ethical principle. Ultimately, law must not only regulate complexity but also carry a narrative—one that links technological change, social legitimacy, and the protection of future generations.