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*Energy Security, Efficiency, and Sustainability: An Emerging Paradigm and  
Roles of Solid Oxide Cells*

#### Abstract

The evolving global energy landscape is increasingly defined by a paradigm shift towards energy security, with efficiency and sustainability as integral components. Solid oxide cells (SOCs) support this transition by enabling decentralized, fuel-flexible, and reversible operations for electricity generation and fuel production. Advancements in SOC technology enhance resilience, reduce reliance on imported energy, and support the transition to next-generation energy systems. This talk will describe this fundamental shift and explore the role of SOCs in shaping energy security, addressing current challenges, and outlining pathways for their integration into future energy systems.