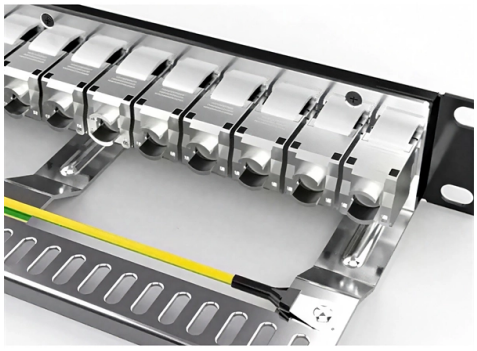
Global Energy Interconnection Influence



Overview

This study uses the Global Trade Analysis Project (GTAP) model to explore the economic and social impacts of the GEI initiative.

Key Takeaways

The development of Global Energy Interconnection (GEI) is influenced by technical, economic, environmental, policy, and social factors, all of which interact to determine its feasibility and effectiveness.

Technical Factors

Technical considerations are central to GEI development. The integration of ultra-high voltage (UHV) AC and DC transmission systems enables long-distance, large-scale energy transfer with minimal losses, which is critical for connecting renewable energy sources across regions and continents. Advanced smart grid technologies, including wide-area monitoring, adaptive control, and energy management systems, enhance system reliability, resilience, and real-time operational efficiency.

The interoperability of multiple systems and adherence to international standards are essential to ensure seamless integration and global acceptance.

Economic Factors

Economic viability is a key influence.

GE

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I can reduce global CO2 emissions and optimize energy costs by enabling higher penetration of renewable energy, which is increasingly cost-competitive compared to fossil fuels in many regions.

Investment in UH

V infrastructure and smart grids requires substantial capital, but the long-term benefits include improved electricity access, reduced curtailment of renewables, and enhanced industrialization in less-developed regions. Market readiness, pricing mechanisms, and cross-border energy trade policies also affect the economic feasibility of GEI.

Environmental Factors

Environmental considerations drive the adoption of GEI. By facilitating the integration of low-carbon and renewable energy sources such as wind, solar, hydro, and marine energy, GEI contributes to global decarbonization and climate change mitigation. Reducing reliance on fossil fuels also addresses air pollution and health concerns, particularly in regions dependent on traditional biomass or coal.

Environmental regulations and international climate agreements further influence the pace and scale of GEI deployment.

Policy and Regulatory Factors

Government policies, international cooperation, and regulatory frameworks are critical.

GE

I requires cross-border coordination, harmonized standards, and supportive policies to enable large-scale interconnection and energy trade. Regulatory stability, incentives for renewable energy adoption, and alignment with global climate goals are essential to attract investment and ensure long-term sustainability.

Social and Access Factors

Social factors, including electricity access and quality of life, also influence GEI. Approximately 1. 6 billion people still lack electricity, and interconnectivity can improve affordability and reliability of supply.

Public acceptance, workforce readiness, and stakeholder engagement are important for successful implementation.

Summary

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The development of GEI is shaped by a combination of technical innovation, economic feasibility, environmental sustainability, policy support, and social considerations. Effective integration of these factors is essential to achieve a globally interconnected, low-carbon, and resilient energy system capable of meeting future energy demands.

Article Content

Evaluating the economic and social benefits of global energy ...

This study uses the Global Trade Analysis Project (GTAP) model to explore the economic and social impacts of the GEI initiative. Specifically, it incorporates two key factors—average

Global energy interconnection

This White Paper examines the readiness of potential markets for GEI, identifies the technical and economic trends in related technologies and evaluates at a high level the impact on energy,

United Nations Division for Sustainable Development-Publications ...

It examines the technical, economic, legal, political, social and environmental issues associated with electricity interconnections.

Global Energy Interconnection-SciEngine

The potential for renewable energy to make contributions to mitigating the impact of climate change is expected to increase significantly in the longer term.

Large-scale electricity interconnection – Analysis

In keeping with IEA scenarios, the report assesses the short- and medium-term technical, market, regulatory and policy measures, benefits, costs, and investments required to accelerate regional

International Power Interconnections Progress and Help Countries in

Various progresses in advancing new power interconnection projects are taking place around the world. Five of these recent projects have been selected and are briefly presented as

Economic Implications of Global Energy Interconnection

This study uses a Computable General Equilibrium (CGE) model to quantify the economic implications of the proposed Global Electricity Interconnection (GEI) electricity system.

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The Future of Power: Cross-Border Grid Interconnection

If the world can eventually adopt a model of global interconnectedness, starting with proximate regional interconnections, energy availability and renewable energy efficiency can

Power, Renewables & Energy: 2025 M&A Review, 2026 | FTI

Power, Renewables & Energy Transition: 2025 M&A Year in Review and 2026 Outlook Entering 2025, renewable energy mergers and acquisitions (“M&A”) activity encountered significant

A data-driven look at rising U.S. electricity costs and

Electricity costs have become a central part of today''s energy policy conversation. Low-cost power has long underpinned U.S. economic strength, but

Global Energy Storage Growth Upheld by New Markets

The global energy storage market is poised to hit new heights yet again in 2025. Despite policy changes and uncertainty in the world''s two largest

Global battery energy storage system (BESS) trends

Battery energy storage systems (BESS) now sit at the heart of the global shift toward flexible, renewable-dominated grids. Understanding the regional trends

A comprehensive review on the benefits and challenges of global

Within the literature a variety of terminology is applied such as Global Energy Interconnection (GEI), Global Energy Internet, Global Transnational Grid (GTG), global

China''s Global Energy Interconnection: Exploring the Security ...

The authors of this report demystify the potential global security implications associated with the Global Energy Interconnection—China''s important but poorly understood initiative to

Exploring China''s global energy connectivity and impact

Conclusion: The Future Landscape of Global Energy Governance The Global Energy Interconnection initiative encapsulates both opportunities

Global Energy Interconnection: an effective solution to climate ...

GEI was founded to seek a solution to global energy and environment challenges, focusing on energy security and environmental issues related to fossil energy utilization. The

Evaluating the economic and social benefits of global energy ...

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Abstract The Global Energy Interconnection (GEI) development will bring various economic and social benefits to multiple regions. To effectively promote its implementation,

Research and Outlook on Global Energy Interconnection

The Global Energy Interconnection (GEI) is a clean energy-dominant, electricity-centered, interconnected and shared modern energy system. It is an important platform for large-scale

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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