

Article Overview

The Global Energy Interconnection Development Plan (GEI) is a strategic initiative to create a worldwide electricity network powered predominantly by clean energy, integrating smart grids and ultra-high voltage systems to promote sustainable development and global energy security.

Overview

The Global Energy Interconnection (GEI) is a proposed global electricity network designed to link 80 countries through an eighteen-line backbone of ultra-high voltage (UHV) connections, incorporating smart-grid technology and renewable energy sources . The concept was first proposed by Chinese President Xi Jinping in 2015 at the UN Sustainable Development Summit and is supported by the State Grid Corporation of China (SGCC) and international organizations . GEI aligns with the UN 2030 Agenda for Sustainable Development, aiming to provide clean, reliable, and universally accessible electricity while addressing climate change, energy poverty, and ecological restoration .

Objectives and Goals

The GEI Development Plan focuses on several key objectives:

- o Clean Energy Integration: Promote renewable energy sources such as wind, solar, and hydroelectric power, reducing reliance on fossil fuels .
- o Global Grid Interconnection: Connect national and continental grids to form a transcontinental network, enabling efficient energy sharing and balancing supply and demand across regions .
- o Sustainable Development: Support economic growth, social development, and ecological restoration, including water conservation and emission reduction .
- o Universal Access: Ensure electricity access for all populations, particularly in developing countries .
- o Technological Innovation: Implement smart grids, UHV transmission, and energy efficiency measures to optimize energy distribution and system reliability .

Implementation Roadmap

The GEI plan is structured in three phases over approximately 50 years :

- o Phase 1: Integrate national grids, build new smart grids, and increase renewable energy usage.
- o Phase 2: Connect continental grids to enhance regional energy interconnection.
- o Phase 3 (2030-2070): Develop Afro-Eurasian transcontinental grids linked by UHV systems, achieving a fully interconnected global energy network. The Global Energy Interconnection Action Plan outlines Ten Actions--including concept promotion, clean development, electricity replacement, smart grid deployment,

energy efficiency enhancement, innovation, capacity building, and policy support--and Five Cooperation Mechanisms to facilitate international collaboration .

Standards and Technical Framework

To support GEI, seven technical standards have been issued for wind farms, photovoltaic plants, and pumped storage units, covering planning, resource assessment, grid interconnection, and automatic control systems . These standards aim to reduce technical barriers, promote cross-border energy flow, and accelerate the global adoption of clean energy technologies.

Global Significance

GEI is expected to:

- o Reduce global carbon emissions and water consumption. By 2050, it could save over 100 billion cubic meters of water annually and significantly cut energy-sector emissions .
- o Enhance energy security through interconnection, co-construction, and shared resources among countries .
- o Provide investment opportunities and foster international cooperation in the energy sector . In essence, the GEI Development Plan represents a systematic, long-term strategy to transition the world toward a clean, low-carbon, and interconnected energy future, addressing both environmental and socio-economic challenges on a global scale.

A set of energy interconnection standards for wind farms, photovoltaic power plants and pumped storage units was

Mr. LIU Zhenya, Chairman of Global Energy Interconnection Development and Cooperation Organization, Mr. Elnar Remi Holmen,

Global energy interconnection (GEI) is technically highly complex. It will require a level of dependability never seen

GEIDCO Overview Launched in March 2016 with its headquarters in Beijing, China, Global Energy Interconnection Development and

Strategic System Roadmap GEI Backbone Grid In the cause of building GEI, the overall plan is to adhere to a path of green, low

Research and Outlook on Central and South American Energy Interconnection

The provision of low carbon energy to our society is a key issue at the heart of sustainable development of global energy supply. The

The authors of this report demystify the potential global security implications associated with

The focus is to make global, regional and national power grid development plans based on overall consideration of world's resource

Concept of Global Energy Interconnection o GEI is an interconnected modern energy system, dominated by clean energy and

global innovation plan for achieving the goals in Paris Agreement. GEI is a robust and smart power grid with Ultra-High Voltage

Energy Planning Research and Outlook on Global Energy Interconnection Full Report Summary

Under the theme "Global Energy Interconnection: Meeting Global Power Demand with Clean and Green Alternatives", the

At a launch conference in Beijing, the Global Energy Interconnection Development and Cooperation Organization

The Global Energy Interconnection (GEI) development will bring various economic and social benefits to multiple

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