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Reflections on Bhutan s Energy Internet



Overview

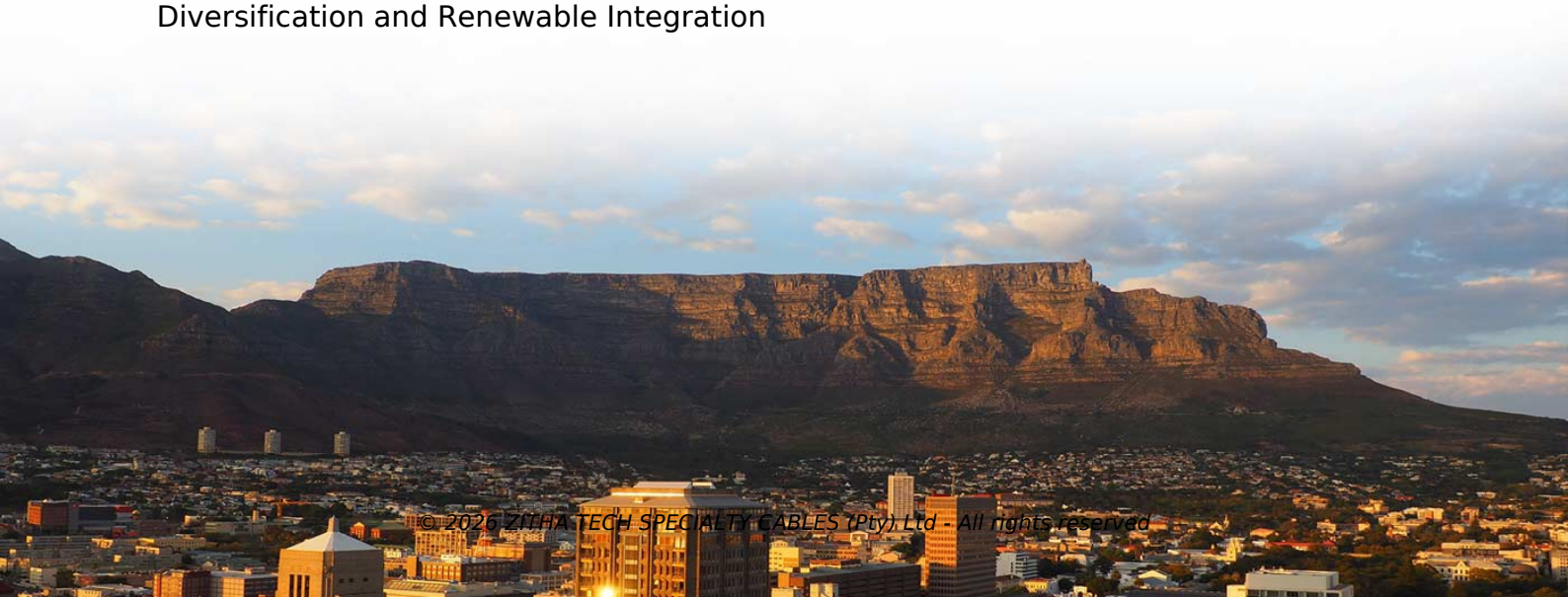
The Shift to Electric: Bhutan's Energy RevolutionBhutan is poised for an electric revolution, aiming to reduce fuel dependency and enhance economic resilie.

Key Takeaways

Bhutan's Energy Internet is a forward-looking, integrated approach that leverages hydropower, solar, and other renewables to ensure energy security, economic growth, and regional green energy leadership.Hydropower as the Backbone

Bhutan's energy strategy is deeply rooted in its abundant hydropower resources, which account for over 90% of national electricity generation . The National Energy Policy 2025 emphasizes hydropower not only as a source of revenue but as a cornerstone of national development, enabling socio-economic progress and energy independence . Projects like Kholongchhu, Dorjilung, and Wangchhu are central to expanding installed capacity, with a long-term goal of achieving 25,000 MW by 2040 . Hydropower exports, primarily to India, also reinforce Bhutan's carbon-negative status and contribute to regional decarbonization .

Diversification and Renewable Integration



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Recognizing the seasonal variability of hydropower and rising domestic demand, Bhutan is actively diversifying its energy mix. Large-scale solar projects, such as Reliance's 500 MW solar farm and Tata Power's 600 MW Kholongchhu project, complement hydropower and enhance energy resilience . The policy also encourages wind, biomass, and emerging technologies like green hydrogen, reflecting a holistic approach to renewable energy integration . This diversification ensures that Bhutan can meet peak winter demand and maintain a reliable, round-the-clock energy supply .

Energy Internet and Connectivity

Bhutan's vision for an Energy Internet extends beyond generation to include connectivity, market development, and regional energy trade. The policy promotes dynamic tariff setting, power market integration, and private sector participation, creating a framework for efficient energy distribution and cross-border electricity trade . By linking hydropower and solar assets with smart grid technologies and regional networks, Bhutan is positioning itself as a hub for green energy in South Asia .

Socio-Economic and Environmental Impacts

The Energy Internet strategy aligns with Bhutan's Gross National Happiness philosophy, balancing economic growth with environmental stewardship . Investments in renewable energy attract financing, create jobs, and support local communities while maintaining forest cover and ecological integrity . The inclusive design of Bhutan's Nationally Determined Contribution (NDC 3.0) ensures that energy development addresses social equity, gender considerations, and climate resilience .

Strategic Reflections

Bhutan's Energy Internet exemplifies a model where clean energy drives national prosperity and regional sustainability. By combining hydropower dominance with solar and other renewables, integrating market mechanisms, and fostering private-public partnerships, Bhutan is creating a resilient, low-carbon energy ecosystem. This approach not only secures domestic energy needs but also positions Bhutan as a leader in regional green energy trade, demonstrating how small nations can leverage renewable resources for both national and global impact .

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1.8 The energy sector was governed by several policies, such as the Bhutan Sustainable Hydropower Development Policy-2021,

Bhutan Energy Situation

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Bhutan is working in close cooperation with its neighbouring country India to harness its hydropower. Energy Situation Renewable

Energy in Bhutan

Energy in Bhutan is characterized by its near-total reliance on hydropower for electricity generation, which supplies 100% of the

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Currently, there are eight Internet service providers in the country, but only three provide Internet services nationwide.

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Because Bhutan is heavily dependent on rivers—through hydropower—for their own

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Distributed energy resources provide far greater resilience, scalability and sustainability than traditional power plants,

ICT Co-Deployment with the Electricity Infrastructure: The Case

Executive Summary For the Royal Government of Bhutan (RGoB), providing affordable and reliable communications facilities to all

Renewable Energy – Bhutan Ecological Society

In collaboration with the government, multilateral partners, and local communities, we will pilot and scale up renewable energy

National Energy Policy 2025

To address these challenges, the NEP 2025 sets a bold new direction for Bhutan''s energy sector, focusing on

Energy transition pathways for the 2030 ESCAP agenda : SDG 7

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