

The Internet as a New Energy Source



Overview

Explore our 24x7—carbon-free internet and learn more about the way we integrate sustainability into Google products and services.

Key Takeaways

The Internet itself is not a direct energy source, but it can be integrated with renewable energy systems and energy recovery technologies to contribute to sustainable energy use. Internet Energy Consumption

The Internet consumes enormous amounts of energy due to data centers, network infrastructure, and billions of connected devices. For example, data centers alone require significant electricity for both computing and cooling, and global Internet usage is projected to account for up to 20% of electricity consumption by 2025, contributing substantially to carbon emissions . Even routine activities like Google searches or video streaming collectively consume terawatt-hours of electricity annually .

Renewable Internet Initiatives

The concept of a Renewable Internet focuses on powering Internet infrastructure entirely with renewable energy sources such as solar, wind, hydro, and geothermal power. This approach includes energy-efficient data centers, optimized network infrastructure, and sustainable device manufacturing, aiming to reduce the Internet's carbon footprint while maintaining digital growth . Some data centers already utilize waste heat recovery to provide heating for nearby buildings, effectively converting otherwise lost energy into usable forms.

Energy Internet Concept

The Energy Internet is a futuristic framework that combines digital networks with energy systems. It envisions a bidirectional flow of energy and information, integrating small-scale renewable energy systems, storage devices, and electric vehicles. Energy routers, analogous to data routers, manage the distribution of electricity efficiently across a network, enabling local energy sharing and smart grid optimization . While no large-scale implementation exists yet, this concept demonstrates how Internet technologies can facilitate energy management and distribution.

Conclusion

While the Internet does not generate energy on its own, it can serve as a platform for energy efficiency, renewable integration, and energy distribution. Through renewable-powered infrastructure, waste heat recovery, and the Energy Internet framework, digital networks can play a significant role in sustainable energy systems, effectively linking information technology with energy innovation .

Article Content

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Based on this notion, this article illustrates the contribution of batteries in improving the Internet of Everything under the

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Energy Internet: A Novel Green Roadmap for Meeting the Global

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First, a comprehensive overview of Energy Internet is presented along with its aptness as a future evolution of

Energy Internet: Redefinition and categories

In this paper, we propose the redefinition of EI, based on a comprehensive literature review, some latest trends and

Recent advancement of energy internet for emerging energy

Key features of the energy internet such as energy sources, communication technologies, data computation, energy

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What Is Energy Internet? Concepts, Technologies, and Future

To realize renewable-energy-based electrification goals, a new concept the Energy Internet (EI) has been proposed, inspired by the

The Emerging Energy Internet: Architecture, Benefits, Challenges, and ...

Energy Internet is a concept proposed to harness, control, and manage energy resources effectively, with the help of

Clean Energy: 24x7—Carbon-free Internet

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Energy Internet, the Future Electricity System: Overview, Concept ...

Energy Internet, a futuristic evolution of electricity system, is conceptualized as an energy sharing network. Its

Powering the beast: why we shouldn't worry about the Internet's rising ...

Fighting fit Data centres, which power the Internet, are incredibly efficient in terms of energy use. (Courtesy:

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Rechargeable batteries, which represent advanced energy storage technologies, are interconnected with renewable

Renewable energy – powering a safer future | United Nations

What is renewable energy? Derived from natural resources that are abundant and continuously replenished, renewable energy is key

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A version of this article appears in print on, Section B, Page 1 of the New York edition with the headline: The Internet

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With the intensifying energy crisis and environmental pollution, the Energy Internet and corresponding patterns of

The Internet Shouldn't Run on Dirty Energy

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Internet and communications technology: Global energy consumption ...

2013 review of research and article in the journal Science on the global energy consumption of Internet and

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