

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

Batteries boost the internet of everything: technologies and potential ...

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

The internet consumes extraordinary amounts of energy. Here's how

How much energy does the internet use, and - given recent technological advances - could it ever run on renewable

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Energy Internet (often reflects Internet plus energy) is a novel energy network that interconnects the power system

Energy Internet: A Novel Green Roadmap for Meeting the Global

This paper describes the basic features and the key structure of Energy Internet, proposes a hierarchical model, and presents key

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

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

Development and Prospect of Key Technologies of Energy Internet ...

Firstly, the essential concept and main features of the energy Internet are expounded. Secondly, according to the

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The Internet and the new energy economy describes the convergence of digital technology and resource

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An inside look at the sources of Google's electricity around the globe gauges how we're tracking toward our long-term

Why your internet habits are not as clean as you think

Less obvious, but perhaps even more energy intensive, are the data centres and vast servers needed to support the

The Internet of Energy (IoE): A Guide to Efficiency and Automation

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Renewable energy | UNEP

Renewables on the rise For the 760 million people in the world who lack access to electricity, the introduction of

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

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

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:

Batteries boost the internet of everything: technologies and potential ...

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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Here's how Musk's clean-energy goal and Starlink's connectivity solution link:
Energy systems in remote or off-grid

A comprehensive review of Energy Internet: basic concept ...

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

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The internet may seem to exist in the ether, but its plumbing includes a vast network
of data centers, also known as

Internet and communications technology: Global energy consumption ...

2013 review of research and article in the journal Science on the global energy
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We need a fossil-free internet by 2030

A fossil free internet is an internet where we have transitioned away from powering it
by primarily burning fossil fuels to generate

Powering the Internet with renewable energy

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