

# **Renewable-Powered Data Centers Market Forecasts to 2034 – Global Analysis By Component (Power Infrastructure, Cooling Infrastructure, IT Equipment and Software & Energy Management Services), Energy Source, Data Center Type, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Renewable-Powered Data Centers Market is accounted for \$18.25 billion in 2026 and is expected to reach \$115.94 billion by 2034 growing at a CAGR of 26.0% during the forecast period. Data centers powered by renewable energy are reshaping modern IT infrastructure by utilizing sustainable sources like wind, solar, and hydroelectric power. These centers significantly cut carbon footprints, improve energy efficiency, and support worldwide sustainability initiatives. Incorporating innovative energy management tools and eco-friendly technologies ensures consistent performance with minimal environmental harm. Organizations are increasingly turning to renewable-powered data centers to comply with regulations and demonstrate corporate responsibility. Over time, the use of renewable energy can also reduce operating expenses and strengthen energy reliability, positioning these data centers as essential components of a greener, more sustainable digital ecosystem.

According to Energy Magazine (2025), the world's 10 largest data centers now run entirely on renewable energy, using wind, solar, and hydropower. These hyperscale facilities demonstrate that growth and sustainability can co-exist, with IT capacities measured in hundreds of megawatts.

## **Market Dynamics:**

### Driver:

#### Growing focus on sustainability

Rising awareness of environmental sustainability is accelerating the shift toward renewable-powered data centers. Organizations and policymakers are increasingly prioritizing operations that reduce energy consumption and carbon emissions. Given the significant energy demands of data centers, transitioning to clean energy sources like wind and solar is becoming essential. Businesses and governments aim to meet climate targets and demonstrate corporate responsibility through green infrastructure. This growing emphasis on sustainable practices drives funding for renewable energy solutions, promotes advancements in energy-efficient technologies, and establishes environmentally friendly data centers as a crucial strategic investment for companies committed to long-term ecological impact.

### Restraint:

#### High initial investment costs

The considerable upfront costs of renewable-powered data centers act as a major barrier to market growth. Setting up solar panels, wind turbines, or other green energy systems requires heavy capital investment. Integration with current data center infrastructure, energy storage solutions, and specialized maintenance further increases expenses. Small and mid-sized businesses may struggle with these initial costs, slowing adoption rates. Although renewable energy can reduce operational expenses over time, the high financial entry requirement remains a deterrent. This economic challenge particularly affects emerging markets, restricting the large-scale deployment of environmentally sustainable data centers despite their long-term benefits.

### Opportunity:

#### Adoption of advanced energy storage solutions

Advanced energy storage solutions offer significant potential for renewable-powered data centers. Lithium-ion and next-generation solid-state batteries allow facilities to store excess renewable energy and use it when production is low. This reduces dependency on traditional power grids and addresses the variability of renewable sources. Improved storage technology enhances operational reliability and ensures uninterrupted services. With declining battery costs and higher efficiency, adoption of

energy storage is becoming increasingly viable. The synergy between renewable energy and modern storage systems is opening new opportunities for growth, enabling data centers to operate sustainably while maintaining high performance and reliability.

Threat:

#### Cybersecurity risks in renewable integration

The adoption of renewable energy in data centers introduces potential cybersecurity threats. Systems like smart grids, IoT devices, and energy management platforms increase connectivity, creating opportunities for cyberattacks. Unauthorized breaches or tampering could disrupt power supply, cause operational interruptions, and risk data integrity. Since renewable-powered data centers depend on digital tools to manage and optimize energy, vulnerabilities in networks or software can have serious consequences. The reliance on interconnected technologies emphasizes the importance of strong cybersecurity protocols. Without adequate protections, these threats could limit market growth and reduce stakeholder confidence in the security and reliability of renewable-powered data centers.

#### **Covid-19 Impact:**

The COVID-19 crisis had both positive and negative effects on the renewable-powered data center sector. Supply chain interruptions and lockdown measures delayed the construction and integration of renewable energy systems, increasing project timelines and costs. Conversely, the rapid shift to remote work, online services, and cloud computing boosted demand for data center capacity. This underscored the necessity of energy-efficient, sustainable infrastructure. Although short-term challenges slowed deployment, the pandemic emphasized the value of resilient and environmentally responsible data centers. Consequently, it strengthened long-term investment prospects and interest in renewable-powered facilities worldwide, highlighting sustainability as a critical priority for digital operations.

The power infrastructure segment is expected to be the largest during the forecast period

The power infrastructure segment is expected to account for the largest market share during the forecast period, given its vital role in delivering consistent energy from renewable sources like solar, wind, and hydro. Critical components such as transformers, switchgear, and backup solutions are necessary to ensure smooth

integration of clean energy into data center operations. Increasing focus on sustainability and efficient energy use has amplified the need for advanced power systems. With the continuous growth of data centers, power infrastructure remains the backbone of renewable-driven operations, enabling reliable performance and supporting the transition to eco-friendly digital infrastructure worldwide.

The hybrid renewable systems segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the hybrid renewable systems segment is predicted to witness the highest growth rate. By integrating multiple energy sources such as solar, wind, hydropower, and biomass, these systems provide enhanced reliability and consistent energy supply. They address the intermittency limitations of individual renewables, ensuring continuous power for essential data center operations. With the increasing emphasis on sustainability and operational resilience, hybrid configurations are highly favored by data center operators seeking optimal energy efficiency. Their adaptability, scalability, and effectiveness are driving rapid market adoption, making hybrid renewable systems a major contributor to the global growth of renewable-powered data centers.

### **Region with largest share:**

During the forecast period, the North America region is expected to hold the largest market share, driven by its mature digital infrastructure and widespread adoption of clean energy solutions. The availability of solar and wind resources, combined with supportive regulations and sustainability-focused policies, encourages the establishment of eco-friendly data centers. Major operators in the U.S. and Canada are actively investing in renewable-powered infrastructure to meet environmental targets and compliance standards. Awareness of energy efficiency and efforts to reduce carbon emissions further promote adoption. The synergy of advanced technology, government support, and corporate sustainability initiatives positions North America as the leading region in the renewable-powered data center market.

### **Region with highest CAGR:**

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, fueled by rapid digital expansion, widespread cloud adoption, and increasing internet usage. Key countries like China, India, and Japan are heavily investing in renewable energy systems to sustainably meet rising power requirements. Supportive

government policies, incentives, and subsidies further promote the adoption of green infrastructure. Strong demand for energy-efficient and low-carbon data centers from technology and e-commerce sectors encourages deployment of renewable-powered facilities. The region's combination of technological advancements, regulatory support, and focus on sustainability drives its position as the market's fastest-growing area.

### **Key players in the market**

Some of the key players in Renewable-Powered Data Centers Market include IBM Corporation, Hewlett Packard Enterprise, Dell Technologies, Schneider Electric, Vertiv Inc, Eaton Corporation, Equinix Inc, Digital Realty Trust, NTT Communications, ABB Ltd., Iron Mountain, Cisco, Huawei Technologies, Green Mountain AS and Switch Inc.

### **Key Developments:**

In December 2025, IBM and Confluent, Inc. announced they have entered into a definitive agreement under which IBM will acquire all of the issued and outstanding common shares of Confluent for \$31 per share, representing an enterprise value of \$11 billion. Confluent provides a leading open-source enterprise data streaming platform that connects processes and governs reusable and reliable data and events in real time, foundational for the deployment of AI.

In December 2025, Dell Technologies is acquiring the Israeli company Dataloop AI for \$120 million in an all-cash deal, Calcalist has learned. The deal marks a significant strategic step for the American computing giant, which in recent years has expanded its investments in artificial intelligence and is building end-to-end AI infrastructure solutions for corporate customers.

In November 2025, Schneider Electric announced a two-phase supply capacity agreement (SCA) totaling \$1.9 billion in sales. The milestone deal includes prefabricated power modules and the first North American deployment of chillers. The announcement was unveiled at Schneider Electric's Innovation Summit North America in Las Vegas, convening more than 2,500 business leaders and market innovators to accelerate practical solutions for a more resilient, affordable and intelligent energy future.

Components Covered:

Power Infrastructure

Cooling Infrastructure

IT Equipment

Software & Energy Management Services

Energy Sources Covered:

Solar-Powered Data Centers

Wind-Powered Data Centers

Hydropower-Integrated Data Centers

Biomass-Powered Data Centers

Geothermal-Powered Data Centers

Hybrid Renewable Systems

Data Center Types Covered:

Hyperscale Data Centers

Colocation Data Centers

Enterprise Data Centers

Edge Data Centers

End Users Covered:

IT & Telecom

Banking, Financial Services & Insurance (BFSI)

Healthcare & Life Sciences

Government & Defense

Manufacturing & Automotive

Retail & E-Commerce

Media & Entertainment

Education & Research

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

*Renewable-Powered Data Centers Market Forecasts to 2034 – Global Analysis By Component (Power Infrastructure,...*

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

### **Free Customization Offerings:**

All the customers of this report will be entitled to receive one of the following free customization options:

#### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

#### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

#### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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