Trends and Outlook for 24/7 Carbon-Free Electricity

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24/7 Carbon-Free Electricity (24/7 CFE)" refers to the continuous use of zero-carbon electricity, 24 hours a day and 365 days a year, ensuring that electricity demand at every moment is met by renewable energy or other zero-carbon sources. This goal represents a stricter standard compared to the annual or monthly renewable energy matching methods previously advocated by the RE100 initiative (100% renewable energy). It emphasizes achieving zero-carbon electricity matching on an hourly basis to facilitate a comprehensive transformation of power grid systems.

To advance this vision, the 24/7 Carbon-Free Coalition released the latest technical criteria for carbon-free electricity in May 2025. Qualified energy sources include wind power, solar energy, zero-emission geothermal energy, ocean energy (wave and tidal), sustainable hydropower, and nuclear energy.

Globally, the main drivers of the 24/7 CFE initiative stem from businesses' need for stable and traceable carbon-neutral electricity supplies, a desire to deepen their environmental responsibilities, and an hourly energy-matching strategy that precisely tracks energy usage details. This approach also prepares businesses to meet increasingly stringent Environmental, Social, and Governance (ESG) requirements. Moreover, adopting 24/7 CFE is an essential strategic move for companies to showcase sustainable competitiveness. International tech giants such as Google and Microsoft have actively embraced this initiative, setting industry benchmarks for the implementation of 24/7 CFE.

However, the global rollout of 24/7 CFE still faces several challenges and obstacles, including insufficient proliferation of electricity tracking technology, high costs associated with obtaining real-time data, immature market mechanisms, and inadequate infrastructure. Additionally, most electricity markets currently focus on simpler annual or monthly renewable energy procurement, lacking institutional support for detailed hourly energy matching. Moreover, the regulatory and policy frameworks

are incomplete, posing significant difficulties for businesses aiming to implement 24/7 CFE.

Taiwan occupies an important position within the global supply chain and faces increasing international demands for carbon reduction, necessitating an accelerated transition toward low-carbon operations. Although many Taiwanese companies have joined the RE100 initiative, gaps remain compared to the 24/7 CFE standard, especially concerning the imbalance between green electricity supply and demand, cumbersome processes in signing power purchase agreements, and incomplete electricity trading platforms. Nevertheless, Taiwan is not lagging in global trends due to its existing electricity matching mechanisms and strong Information and Communication Technology (ICT) industry, which holds the potential to develop more precise energy tracking and management systems.

Looking forward, if Taiwan effectively leverages its technological and institutional foundations, enhances governmental policy support, reforms market mechanisms, and invests in infrastructure, it has the potential to significantly advance in the field of 24/7 CFE, thereby seizing critical opportunities in the global energy transition.