Ultracapacitor - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 120 pages | Mordor Intelligence

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Report description:

The Ultracapacitor Market size is estimated at USD 4.00 billion in 2025, and is expected to reach USD 7.80 billion by 2030, at a CAGR of 14.3% during the forecast period (2025-2030).

Key Highlights
- The automotive sector drives the ultracapacitor market. As the industry shifts towards sustainable and energy-efficient vehicles, ultracapacitors are increasingly used in applications like regenerative braking, engine start-stop systems, and energy recovery systems. Their capability to deliver quick energy bursts enhances their effectiveness in these roles. Furthermore, automakers are now exploring hybrid energy storage solutions, merging batteries with ultracapacitors for optimized performance.
- With the surge in renewable energy projects, the demand for efficient energy storage and grid stability solutions has intensified. Ultracapacitors play a pivotal role by storing excess energy during peak production and releasing it during low generation periods, thus aiding grid stabilization. This functionality underscores their importance in renewable energy systems, particularly in wind and solar power.
- Ongoing research and development efforts aim to boost the energy density of ultracapacitors, allowing them to rival conventional batteries. Material innovations, especially with graphene and carbon nanotubes, promise enhanced storage capacity without compromising on high power output and rapid charging. A notable example is EnyGy, a Melbourne-based company, which in 2023 unveiled an ultracapacitor leveraging cutting-edge graphene technology.
- However, supercapacitors have limitations in long-term energy storage. Their discharge rate surpasses that of lithium-ion batteries, leading to a self-discharge loss of 10-20 percent daily. While batteries maintain a near-constant voltage until depleted, capacitors experience a linear decline in voltage with charge.
- Global pushes for cleaner energy and stringent environmental regulations have created a conducive atmosphere for the ultracapacitor market. Policies aimed at reducing carbon emissions and promoting electric vehicles and renewable energy

adoption have bolstered market growth. Moreover, both government and private sector investments in research and development, particularly in energy storage technologies, have accelerated the evolution of advanced ultracapacitors.

Ultracapacitor Market Trends

Automotive and Transportation Sector Experiencing Demand

- The swift rise in the adoption of electric and hybrid vehicles has significantly driven up the demand for ultracapacitors. Unlike conventional batteries, ultracapacitors boast a high power density, enabling rapid charging and discharging. This makes them particularly suited for applications like regenerative braking and start-stop systems. Supercap technologies are being extensively utilized in regenerative braking test rigs, capitalizing on the challenges and opportunities presented by supercapacitor implementation. Their remarkable power density and cycling characteristics make them highly desirable.
- For example, Skeleton Technologies' supercapacitors are featured in the Honda CR-V Hybrid Racer. This demonstration vehicle highlights the prowess of Honda Performance Development and showcases Honda's 2023 IndyCar hybrid power unit technology. Thanks to Skeleton's supercapacitors, the race car enjoys enhanced high-power performance. These supercapacitors are touted as the perfect solution for braking energy recovery and boosting acceleration. They come with notable advantages: low internal resistance, high cyclability, and excellent aging resistance.
- Researchers at KAIST (Korea Advanced Institute of Science and Technology) have unveiled an innovative energy storage solution. This new system merges the strengths of supercapacitors with the cost-effectiveness and supply chain benefits of sodium-ion battery chemistry. The research team envisions their creation making waves in the electric vehicle sector. Their novel battery integrates an advanced anode with a cathode tailored for supercapacitor technology. This synergy enables the battery to boast both impressive storage capacities and swift charge-discharge rates, positioning it as a formidable contender against lithium-ion batteries.
- In the U.S., three primary fast-charging standards dominate: CHAdeMO, Combined Charging System (CCS), and the North American Charging Standard (previously Tesla's standard). Among these, the CCS method leads in the number of fast-charging stations. Data from the U.S. Department of Energy reveals that in 2024, there were 7,315 CCS stations, 5,720 CHAdeMO stations, and 2,280 NACS stations. This expanding infrastructure bolsters the growing use of ultracapacitors in electric vehicles.
- Ultracapacitors are carving out a pivotal role in energy recovery systems, especially in public transport realms like electric buses, trams, and high-speed trains. A key challenge in the automotive industry is sourcing components that can endure high-cycle usage without substantial wear. Ultracapacitors shine in this domain, effortlessly handling millions of charge and discharge cycles with minimal degradation. As the industry leans more towards electrification, fuel efficiency, and sustainability, the significance of ultracapacitors is poised to grow.

Asia-Pacific Region is Driving the Market

- China, Japan, and South Korea lead the charge in electric vehicle production, bolstered by their established automotive industries that heavily invest in innovative energy storage solutions. The region's rapid expansion of EV infrastructure, coupled with a strong push towards sustainable transportation, is set to propel the market further.
- Beyond electric vehicles, the Asia-Pacific region is a significant player in renewable energy investments. With countries like China and India intensifying their solar and wind energy projects, the demand for energy storage solutions has surged. Research from Carbon Brief highlights this trend, noting a 40% year-on-year rise in clean-energy investments, totaling USD 890 billion in 2023. This growth accounted for the entirety of the investment surge across China's economy. Ultracapacitors, known for their swift charging and discharging capabilities, are proving to be pivotal in stabilizing these renewable energy systems.

- The Asia-Pacific region, renowned for its strong manufacturing base and technological advancements, is channeling its focus on research and development. Backed by substantial investments, this emphasis has not only enhanced ultracapacitor performance but also broadened their applications across diverse sectors, from consumer electronics to industrial machinery.
- In a significant leap for electronics manufacturing, India inaugurated its first supercapacitor manufacturing plant in Kannur, Kerala in October 2024. This facility aims to produce top-tier supercapacitors for various sectors, including the Indian defense, electric vehicles, and even space missions.
- Government initiatives, targeting a reduction in carbon emissions and championing green energy solutions, have catalyzed the swift adoption of ultracapacitors. With incentives and subsidies bolstering EV production and renewable energy initiatives, the environment is ripe for the ultracapacitor market's growth.

Ultracapacitor Industry Overview

The ultracapacitor market is fiercely competitive, featuring both established multinational corporations and emerging players that prioritize technological innovation and market expansion. Notable players in this arena include Maxwell Technologies, Skeleton Technologies, LS Mtron Ltd, and Eaton Corporation. These companies have cemented their positions through a robust global footprint, comprehensive R&D capabilities, and a wide array of product offerings.

Competition intensifies with rising demand from sectors like automotive, renewable energy, and industrial applications. Major players are bolstering their R&D efforts, securing investments, and raising funds to solidify their market positions and broaden their product ranges. For example, in October 2023, Skeleton Technologies secured EUR 108M in funding, aimed at fast-tracking the development of next-gen products and expanding supercapacitor manufacturing.

In the ultracapacitor market, continuous R&D is paramount for gaining a competitive edge. Companies are delving into advanced materials, such as carbon nanotubes and graphene, to boost energy density and cut costs. Looking ahead, the market is poised for heightened competition, focusing on technological breakthroughs, cost efficiency, and adapting to the dynamic energy demands of key industries.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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