Electric Double-Layer Capacitor (Edlc) Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 228 pages | Mordor Intelligence

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Report description:

The electric double-layer capacitor (EDLC) market is expected to register a CAGR of 13.19% over the forecast period. An electric double-layer capacitor is a form of energy-saving converter equipment with the potential for high power density, circulation, discharge to charge, low self-discharging, safe operation, and low cost. The connecting region between the electrolyte and electrode materials controls the characteristics of EDLC. Furthermore, the pseudocapacitive can save charge by electro-activating like an EDLC. A dominant share of opportunities for EDLC is expected to be driven by three industries due to the growing application of automotive, energy and utility, and IoT technology.

Key Highlights
EDLCs are substituting batteries in various automotive, grid, and IT applications, offering safety, faster charging, and smaller size while eliminating complicated battery management systems. Improved EDLCs and derivatives benefit mini-grids, trains, trams, trucks, heavy off-road vehicles, small uninterruptible power supplies for IoT nodes using energy harvesting, and data centers.
Storage is one of the biggest obstacles preventing the widespread use of renewable energy sources, like wind and solar power. The US energy grid system distributes energy and allows for limited flexibility for storing excess on short notice. Conventional EDLCs have a high-power output with minimal degradation in performance for as many as 1,000,000 charge-discharge cycles.
Climate change and greenhouse gas emissions have become worldwide threats, affecting crop cycles, weather systems, and ecosystems. Users of energy storage devices are more aware of limiting emissions now that environment-friendliness is a top goal. Major technology firms are increasing their efforts to minimize greenhouse gas emissions, indicating that the market for alternative energy technologies is expanding.
The price difference between an EDLC and a regular battery is a major concern. EDLCs are slightly more expensive than batteries, although they perform additional functions. Although the two technologies are somewhat different, end users require an EDLC's pricing comparable to a lead-acid battery to be considered a financially viable technology. Due to the high power density, the

technology has a limited application base. Therefore, EDLCs failed to achieve the economies of scale necessary for a drastic price reduction. However, manufacturers are strongly pursuing price reductions to gain greater market acceptance and higher adoption.
With the outbreak of COVID-19, the digital revolution in the economy impacted the power sector. From smart meters, digital substations, and smart EV charging infrastructure to software solutions (such as artificial intelligence, digital twins, dynamic line rating, and blockchain technology) governments, utilities, and manufacturers started increasingly embracing digital technologies.

Electric Double Layer Capacitor Market Trends

Increasing Demand for Renewable Energy Solutions to Drive the Market

There are upgrades to power generation from renewable resources to reduce the rapid depletion of natural resources, which is expected to drive the market for EDLCs in the coming years. Moreover, there is an increasing demand for renewable energy generation, observed in countries across Europe, Asia, and the United States, which may further fuel the growth of the market studied.
Furthermore, in November 2021, Researchers from the Advanced Technology Institute (ATI) at the University of Surrey and the University of So Paulo devised an innovative analysis technique that will aid scientists in developing better EDLCs for renewable energy storage. Using the team's innovative approach, researchers may now explore the complicated interconnected behavior of EDLC electrodes formed from layers of different materials.
Also, energy storage improvements are essential if governments meet carbon reduction commitments. Because solar and wind energy are inherently unpredictable, adequate storage is essential to assure supply constancy; EDLCs are seen as a crucial part of the solution. EDLCs may also hold the key to charging electric vehicles far more quickly than lithium-ion batteries allow. However, more research into EDLCs is required to ensure they can successfully store enough electricity.
Governments and enterprises across the globe have announced their commitment to adding around 826GW of new non-hydro renewable power capacity by 2030. Such investments are driving increased opportunities in the market.
Wind turbines use EDLCs for wind turbine pitch control. For instance, a leading wind turbine manufacturer, Suzlon, uses EDLCs for its wind turbines. Due to the increasing awareness and proven efficiency of EDLCs, an increase in the use of EDLCs for wind turbines is expected to occur worldwide. EDLC-based electrical pitch control can provide the best solution in wind turbines. Globally, more than 14,000 installed turbines use EDLCs.

China is Expected to Hold Major Market Share in the Asia-Pacific Region

In China, the demand for EDLC is expected to grow by one of the highest growth rates in the world for a long time to meet the carbon neutrality targets by 2060. Benefiting from the increased demand in downstream markets, such as electric vehicles, the overall market share of EDLCs in China is anticipated to continue to rise.
With policy support from the government, many new players have positioned themselves in the market studied. There are large market players, such as the state-owned CRRC (China Railroad Rolling Stock Corporation), Nantong Jianghai, Shanghai Aowei, and Jinzhou Kaimei. Moreover, there are new players in EDLC manufacturing, such as Beihai Sence Carbon Materials Technology, Jiangsu Zhongtian Technology Group, and Tianjin Plannano Energy Technologies. Research institutions and universities, including Donghua University, Jiangsu University, South Central University, and Tsinghua University, have further been involved in innovation in the EDLCs sector through patent filing, among other things.
The automotive industry is growing rapidly in China, and the country is playing an increasingly important role in the global automotive market. The government views the automotive industry, including the auto parts sector, as one of the country's pillar

industries. The Central Government of China estimates that the country's automobile output may reach 35 million units by 2025, which caters to the demand for EDLCs.
Electric vehicles are becoming more popular, and China is considered one of the leading adopters. For growth in China's transportation industry, the 13th Five-Year Plan encourages the development of green mobility alternatives such as hybrid and electric vehicles.
EDLC electric buses are common in China. The most widely used application for EDLCs in China is the braking energy recovery system of urban hybrid electric buses. The electric buses that were launched are equipped with EDLCs providing high durability with an operating time of 12 years, enduring a million charges under high temperatures.

Electric Double Layer Capacitor Market Competitor Analysis

The EDLC market is highly fragmented due to the presence of both global players and small and medium-sized enterprises. The key players in the market include Eaton Corporation PLC, Maxwell Technologies Inc. (Tesla Inc.), Skeleton Technologies Inc., Cap-XX Limited, and Kyocera Corporation, among others. Players in the market are adopting strategies such as partnerships, investments, and acquisitions to enhance their product offerings and gain sustainable competitive advantage.

In May 2022, TDK Corporation announced to build of a new MLCC production site in Japan with a focus on high-reliable automotive products. The facility will have an integrated production line from materials to finished products.

In January 2022, Skeleton Technologies Inc. secured a round D3 worth EUR 37.6 million (USD 39.11 million) from Wise co-founder Taavent Hinrikus. The investments will be aimed at further scale-up of EDLC production in Saxony, Germany, to meet customer demand and continue the development of implementing the EDLC and curved graphene technology in new battery products.

Additional Benefits:

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

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