Electric Double-layer Capacitor (EDLC) - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

The Electric Double-layer Capacitor Market size is estimated at USD 0.88 billion in 2025, and is expected to reach USD 1.64 billion by 2030, at a CAGR of 13.19% during the forecast period (2025-2030).

The market's growth is attributed to the increased demand for electric double-layer capacitors (EDLCs) across various applications, including battery load leveling in mobile devices, memory backup in electronic devices, energy regeneration, energy harvesting in automobiles, and more. The surging demand for graphene and carbon nanotube EDLCs and government regulations regarding reducing carbon emissions are expected to contribute to the market's growth.

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 are beneficial to mini-grids, trains, trams, trucks, heavy off-road vehicles, small uninterruptible power supplies for IoT nodes using energy harvesting, and data centers. With automotive manufacturers emphasizing reducing dependency on the oil sector and governing bodies imposing stringent environmental regulations, growth prospects for electric vehicles are promising. This has led EDLC manufacturers to explore profitable opportunities in the rapidly evolving automotive industry.
- Smart meters are equipped with a power storage device to supplement their power supply for peak assistance because they need a lot of energy to transmit wireless data. However, to protect data in the case of an emergency, such as a server, power outage, or accident, or when drive recorders need an emergency backup power supply. Smart meters and drive recorders are frequently utilized outdoors, and in other low-temperature situations, power storage devices are expected to maintain their properties at low temperatures.
- Various research is underway to develop affordable and innovative solutions built on current EDLC technology. These solutions

will provide a more affordable and eco-friendly alternative to existing models and stress the need to reduce the cost of carbon electrode production and the dependency on critical components.
- A major concern is the price difference between an EDLC and a regular battery. EDLCs are slightly more expensive than batteries, although they perform additional functions. This is expected to hinder the growth of the market.
- The COVID-19 outbreak and lockdown worldwide have impacted manufacturing activities, especially in Asia-Pacific, where a significant portion of the global EDLCs and electrode materials are manufactured. The surge in COVID-19 cases in Asia caused the closure of major producers of ceramic capacitor factories in China, Japan, and Malaysia. However, industries look forward to significant progress in the post-COVID-19 scenario. Some of their main priorities are advancing commercial testing of materials, progressing commercial negotiations with possible partners, and discovering new paths to market for customized EDLC applications.

Electric Double-layer Capacitor Market Trends

Rising Demand for Renewable Energy Solutions Drives the Market's Growth

- The use of EDLCs for renewable energy applications has grown over the years. Hence, increasing the focus on renewable energy sources is a huge opportunity for EDLC manufacturers. Currently, Asia-Pacific is growing significantly in renewable energy consumption, its variants, and other potential materials, which is driving the EDLC market growth. EDLC is a new energy storage device that can provide more power density than batteries and more energy density than ordinary capacitors.
- Due to their advantages, such as very high efficiency, high charge/current discharge capability, and wide temperature range, EDLCs are being employed in an expanding variety of applications, including renewable energy power production, transportation, power systems, and many more. A hybrid energy storage system consisting of a battery and EDLC (SC) is proposed for use in wind farms to achieve power dispatch ability. The designed scheme controls the battery's charging/discharging powers while the faster wind power transients are diverted to the EDLC. This prolongs the battery's life.
- Several government initiatives will likely drive EDLCs in the market. For instance, the Chinese authorities have recently announced a plan to add more than 30 gigawatts of energy storage capacity by 2025 to enhance renewable energy usage while stabilizing the electric grid. Electricity storage techniques that use electrochemical, compressed air, flywheel, and EDLC systems are referred to as new energy storage, as opposed to pumped hydro, which uses water held behind dams to create electricity as needed.
- According to International Renewable Energy Agency (IENA), in 2022, China was the leading country in terms of installed renewable energy capacity (1,161 gigawatts(GW), followed by the United States (352 GW), Brazil (175 GW), and India (163 GW). With these numbers anticipated to grow further, the renewable energy sector is anticipated to continue to drive the demand for EDLCs.
- Furthermore, energy 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 is used for distributing energy and allows for limited flexibility for the storage of excess on short notice. Conventional EDLCs have a high-power output with minimal performance degradation for as many as 1,000,000 charge-discharge cycles.
- 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. There is an increasing demand for renewable energy generation, observed in countries across Europe, Asia, and the United States, which would further fuel the growth of the market studied.

Europe to Hold Significant Market Share

- The growing adoption of EDLCs in the automotive industries has positively boosted the market's growth in the region, as Europe is among the fastest-growing EV markets. The German automotive industry has been leading technological innovations in the global automotive industry with the integration of smart technologies. Hybrid and electric vehicles are expected to lead the growth of the automotive industry in the country, with the companies focusing on electric vehicle technologies. This is anticipated to impact the growth of the EDLCs market positively.
- The European Commission's Graphene Flagship initiative aims to take graphene from the lab to society within a decade. The initiative's issues in the energy field include the production of graphene to address the requirement of high-quality materials in large quantities, its integration into energy devices while preserving its properties, and device performance improvements using scalable methods suitable for commercialization. As graphene-based materials are widely used as electrodes of EDLCs, such trends favor the studied market's growth.
- Furthermore, European automotive players, such as Lamborghini, the Italian manufacturer of luxury sports cars, have worked in the past with research institutes such as Massachusetts Institute of Technology to build the Lamborghini Terzo Millennio. This electric vehicle uses EDLCs embedded into the car's chassis as a source of energy. Lamborghini's first series-production hybrid cars included advanced electric technology, with the supercar manufacturer focused on lightweight EDLCs and the capacity to store electrical energy in carbon fiber bodywork. The success of such efforts are anticipated to drive more auto manufacturers adopt similar strategy which in turn will drive opportunities in the studied market.
- Due to the rapid investments and government initiatives in several EU regions, there is likely to be a market for EDLC as a result of the surge in renewable energy investments across Europe. The EU Parliament agreed on additional measures in December 2022 to increase the percentage of renewables in the EU considerably ahead of 2030 in response to Russia's aggressiveness in Ukraine and to address the EU's reliance on Russian fossil fuels.
- As a result, the market is expected to continue to profit from the growing use of renewable wind energy in Europe over the forecast period as supercapacitors gain prominence in big wind turbine pitch control applications. For instance, in order to achieve its 2030 climate and energy goals, the EU is predicted to deploy 116 GW of new wind farms between 2022 and 2026, according to Windflix Europe. Using the enormous potential of the five EU sea basins, the installed offshore wind capacity in the EU, which was 14.6 GW in 2021, is expected to expand by at least 25 times by 2030.

Electric Double-layer Capacitor Industry Overview

The electric double-layer capacitor (EDLC) market is fragmented and remains the same over the forecast period. Players in the market are adopting strategies such as partnerships, mergers, product innovations, investments, partnerships, and acquisitions to gain sustainable competitive advantage. Some key market players include Eaton Corporation PLC, Maxwell Technologies, Skeleton Technologies, Kyocera Corporation, etc.

- April 2023 - Researchers at the Indian Institute of Science (IISc) designed an ultra-micro supercapacitor capable of storing an enormous amount of electric charge. According to the researchers, the newly developed capacitor is more compact and much smaller than existing supercapacitors, with potential applications in many devices ranging from consumer electronics to streetlights, medical devices, and electric cars and medical devices.
- January 2023 - Skeleton Technology announced its plans to build the world's largest supercapacitor factory in Saxony, Germany. According to the company, this first-of-its-kind Leipzig Superfactory will include a fully automated supercapacitor production line that will increase the company's production capacity 40-fold. The company expects the start of the production by 2024.

Additional Benefits:

- The market estimate (ME) sheet in Excel format

- 3 months of analyst support

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