

ElectroniCast Consultants



Lithium-Ion Capacitors in Solar Photovoltaic Power Generation Global Market Forecast & Analysis (2011-2021)

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This ElectroniCast report provides a 2011-2021 market forecast and analysis of the worldwide consumption of lithium-ion capacitors (LICs) used in solar photovoltaic (PV) power generation applications.

A capacitor is an electrical device that stores or releases electricity through rapid electrostatic reactions. Compared with a battery that stores electricity through slow chemical reactions, a capacitor makes it possible to charge and discharge electricity almost instantaneously with a long cycle life.

Lithium-Ion Capacitors (LICs) have a higher power density as compared to batteries and LIC's are safer in use than Lithium-Ion Batteries (LIBs), since thermal runaway reactions may occur with the LIBs. Compared to an Electric Double-Layer Capacitor (EDLC), the lithium-ion capacitor has a higher output voltage. They both have similar power densities, but energy density of a lithium-ion capacitor is higher.

Lithium-ion capacitors contain no hazardous substances, such as heavy metals (Cadmium, Mercury or Lead) making them environmentally friendly electrical storage devices. They are also characterized by an ability to charge with even weak current, and as a result, demand is expected to increase substantially in environmentally friendly fields such as solar power generation. The use of lithium-ion capacitors as independent power supplies in combination with photovoltaic panels is considered for a wide range of devices such as streetlights, surveillance cameras, and security sensors.

Photovoltaics (PV) is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic power generation employs solar panels composed of a number of solar cells containing a photovoltaic material.

ElectroniCast Consultants, per requests from clients are following-up on the exciting and innovation aspects of the lithium-ion capacitors, present this report specifically addressing the potential use of lithium-ion capacitors in photovoltaic (PV) power generation applications.

The conclusions of this report are based on background research plus application of quantitative data processing and correlation. ElectroniCast analysts performed interviews with authoritative and representative individuals concerned with the power storage industry sector, plus natural energy power generating technologies (wind, solar and other), energy-efficient lighting (LEDs), industrial logistical machinery/ Automated Guided Vehicles (AGV) / industrial robot, electric vehicles, migration systems of voltage sags/swells, Uninterruptible Power Supply (UPS) devices, and many other concerns and related entities.

The future of the lithium-ion capacitor (LIC) market, despite exciting innovative devices driven by technological advances and ecological/energy-saving concerns, still face challenges in overcoming performance/price limitations and in attracting widespread consumption. The use of LICs in solar photovoltaic power generation applications is increasing, initiating from government-based initiative – then to commercial/business – and eventually to the consumer-level.

On-going extensive customer demand-side and supplier-side information interviews, combined with ElectroniCast background of information and opinions in the energy efficiency solution field were the basis for estimating data to be inserted into the analysis/forecast data base spreadsheets. Published information related to LIC and related component/applications and consumption, was reviewed, including:

- Trade press
- Press release information
- Financial reports
- Web site background information
- Vendor production information
- Other published information

The ElectroniCast market forecast (Excel spreadsheet) database structure used for this project is provided for insertion (and later manipulation) of quantities, prices (and thus value) for lithium-ion capacitors used in solar photovoltaic power generation applications for each year, in each end-user category subset of each geographical region. This technique permits analysis for reasonableness check at all levels. The final database/spreadsheet is the source for the various values incorporated in the tables and figures in this report and quoted in the (report) text.

Regional Market Segmentation This report provides the market data by the following regional segments and sub-regions:

- Global (Total)
 - America
 - United States and Canada
 - Latin America
 - EMEA
 - Northern Europe
 - Southern Europe
 - Western Europe
 - Eastern Europe
 - Middle East and Africa
 - APAC
 - People's Republic of China (PRC)
 - Japan
 - Republic of Korea (ROK)
 - Rest of APAC

Consumption Value: The consumption value of a Lithium-Ion capacitor (LIC) is determined by the final application (“end-use”) and ownership of that product. For example, a packaged LIC produced in Japan (APAC region) and then the LIC ends-up in a new car manufactured in Europe, and then the car is sold and consumed (consumption) in the USA, is shown in the ElectroniCast market forecast Excel database as a LIC consumed in America (not APAC and not Europe).

The estimate of 2011 plus the market forecast (2012-2021) is presented for Lithium-Ion capacitors for use with solar photovoltaic (PV) power generation. The Lithium-Ion capacitor (LIC) market forecast data are segmented by the following functions:

- Consumption Value (US\$, million)
- Quantity (number/Farad: Million)
- Average Selling Prices (ASP \$, each Farad)

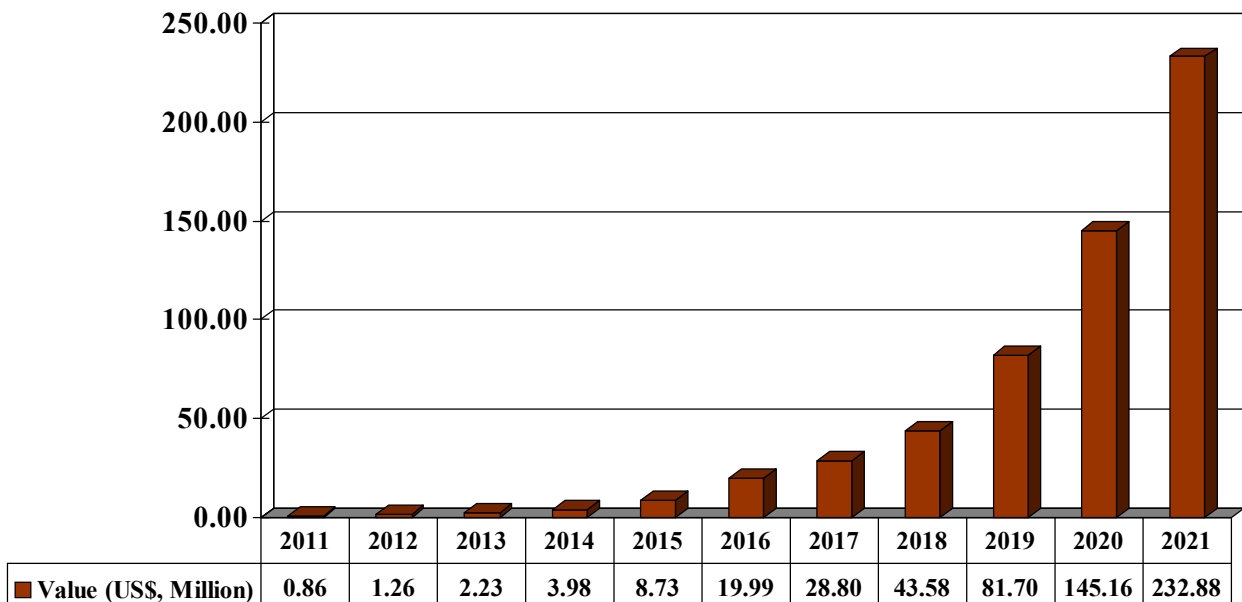
Nominal Capacitance - Farad (F): The farad (symbol: F) is the SI unit of capacitance (SI is the International System of Units). Capacitance is the ability of a capacitor to store energy in an electric field. Capacitance is also a measure of the amount of electric potential energy stored (or separated) for a given electric potential. A common form of energy storage device is a parallel-plate capacitor.

Market Forecast Application Categories The ElectroniCast market forecast of consumption is also presented for two major End-User categories:

- Government/Commercial
- Residential/Non-Specific

Market Forecast: LICs used in Solar PV Power Generation ElectroniCast estimates that in 2011, the worldwide consumption value of lithium-ion capacitors used in solar photovoltaic power generation applications will reach (only) \$0.862 million; consumption value is forecast to increase at an average annual growth rate of 87.5 percent to \$19.99 million in 2016 ⁽¹⁾. From 2016-2021, the total consumption value is forecast an increase 63.4 percent per year, reaching \$232.88 million in the year 2021.

**Lithium-Ion Capacitors (LICs) used in Solar Photovoltaic Power Generation
 Global Market Forecast (Value Basis, US\$ Million)**



⁽¹⁾ All values and prices in this report are at end-user levels, and are in current dollars, which include the effect of a forecasted 5 percent annual inflation rate over the forecast period.

Note: Market forecast data in this study report refers to consumption (use) for a particular calendar year; therefore, this data is not cumulative data. Market forecast data are provided in United States Dollars.

Lithium-Ion Capacitors in Solar Photovoltaic Power Generation Market Analysis & Forecast (2011-2021)

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