

## About Supercapacitors

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"Supercapacitor" is the general term for "electric double layer capacitor", a new device capable of storing electricity. These devices are also known as "Ultracapacitors".

Unlike batteries that are made using heavy metals, electric double layer capacitors are made of basic raw materials such as organic electrolyte fluid, aluminum and carbon, meaning they have only a small impact on the environment, and do not contribute to the overuse of natural resources. Furthermore, with little energy loss during periods of charge and discharge, and an extremely low level of internal resistance, they are capable of short bursts of high energy output that batteries aren't, and unlike batteries, there is no risk of explosion. These devices also benefit from an extremely long life-span, said to be one hundred times greater than those of regular batteries.

However, for a long time these capacitors were only been capable of storing a very small amount of electricity, and it was essential to improve their energy density [Wh/kg]. However, in 1992, new kinds of supercapacitor emerged from Japan, and in recent years, a variety of supercapacitors that have a remarkably higher energy density have been developed all over the world. These highly efficient capacitors bring enormous potential to the development of hybrid cars, electric trains, and nighttime electricity storage facilities. In particular, supercapacitors are perfectly compatible with weather-derived natural energy sources such as solar power and wind power, which have been evaded for so long — with the combination of these technologies, a society based on the supply of renewable energy is no longer just a dream.

In this way, supercapacitors present the world with a highly viable solution to its energy problems and environmental problems, and yet the present state of affairs is that they remain too expensive for widespread proliferation. It is said that lead batteries took forty years to reach their current price; when one considers this length of time, it is evident that steps need to be taken to make supercapacitors more affordable.

In China there are already electric trolleybuses that run only on supercapacitors, and in the United States, hybrid trucks and buses are already in use, both of which have shown more than a 30% reduction in CO2 emissions (which is equal to a rise in fuel consumption). On the other hand, with the construction of Masdar City in Abu Dhabi, built entirely to run on natural energy sources, there has been some progression in the global move towards abandoning the use of fossil fuels.

In Japan too, top class engineers are devoting themselves every day to developing new technologies that will save humanity. If the technology is right there before our eyes, but the only thing preventing it from taking off is the high price, then I believe we have to find a way to remove that obstacle.

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