ECO-DEVELOPMENT BY CAPACITOR—Sustainability and Economic Development

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Electrical energy storage is one of the most important technological matters in the 21st century while global warming becomes conscious and serious bringing us a major climate shift in our planet Earth. In such a situation a word “electrochemical capacitor” attracts more and more attentions recently as “eco-development” energy device. There are many practical advantages for capacitors such as high power density, high reliability, long cycle life, excellent safety issues, and environment friendliness all of which may not be fulfilled by conventional batteries at the same time. The capacitors or more specifically Electric Double Layer Capacitors (EDLCs) are related greatly with all industry and relevant markets. Major domestic and international automotive industries pay much attentions to the capacitor, and new comers join in this field like a domino effect. Japan dominates worldwide capacitor market for the overwhelming high level technology of the conventional EDLCs, however the future depends very much on the development of advanced capacitors of high energy density ($> 20 \text{ Wh/kg}$) with significantly reduced manufacturing cost.

For the purpose of the much further development of this key technology, it is indispensable that industries and the universities work hand-in-hand closely and cooperates together. The promotion of the following items are strategically necessary to be successful: 1. Fundamental research of the new capacitor materials and its processing nano-technology, 2. Device technology and its cost effectiveness, 3. Potential market analysis and application engineering in combination with lithium ion batteries, solar cells and fuel cells, 4. Development of human resources with high expertise in capacitor technology.

Finally, we should encourage the campaign for the promotion of capacitor technology in the society, so that the uses of the technology attain energy saving without sacrificing economic development (ECO-DEVELOPMENT).

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