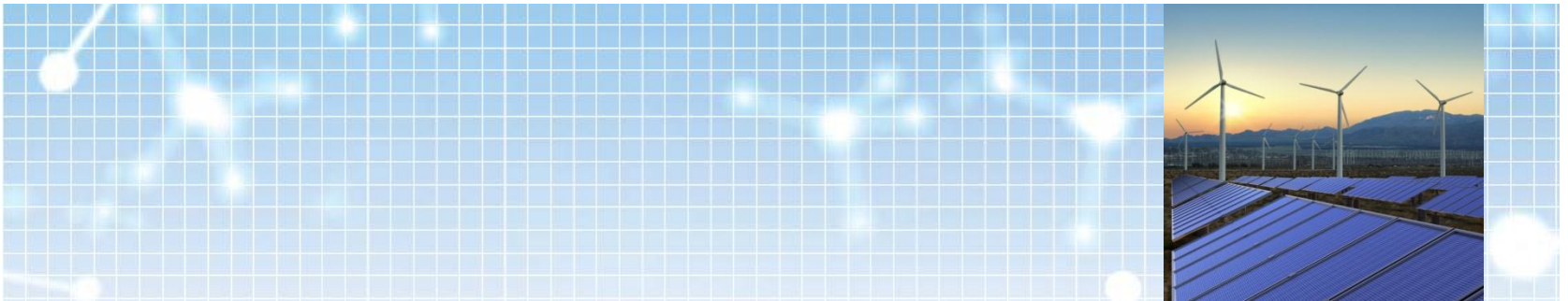


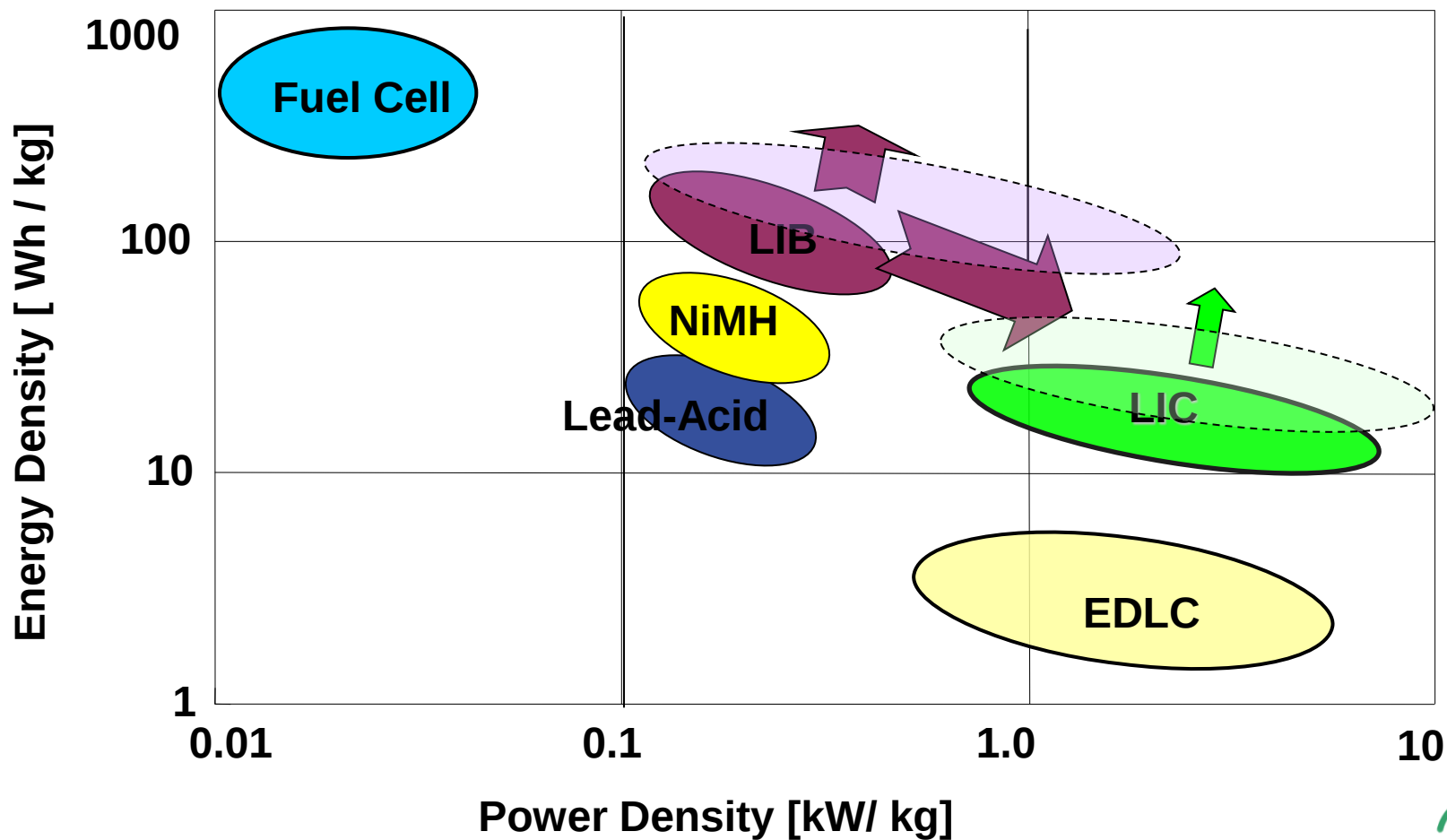
Environment and Energy

Lithium Ion Capacitor Technology & products Introduction – June 2013



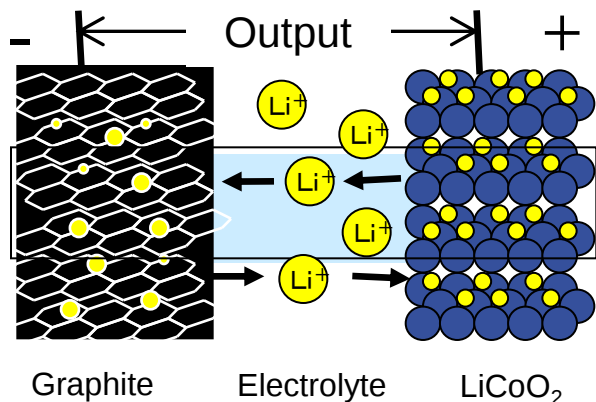
Overview performance of LIC

High power, and high energy density capacitor

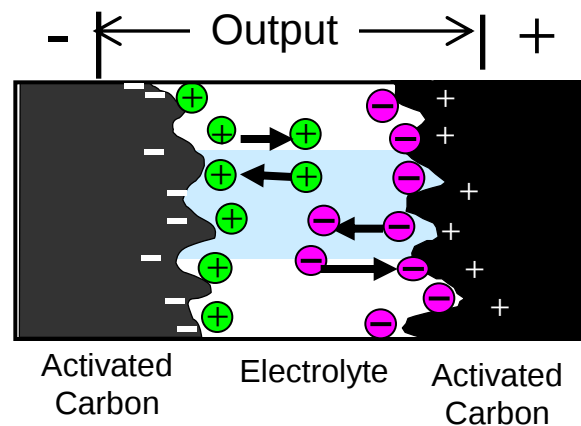


Concept of Lithium-ion Capacitor

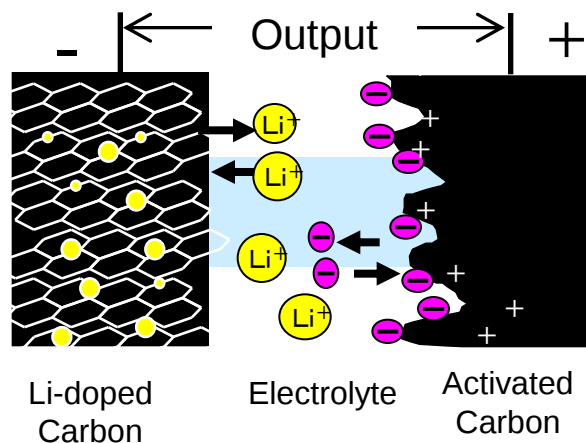
Lithium-ion Battery



EDLC



Lithium-ion Capacitor



Characteristics of LIC

- High operation Voltage
- High energy density combined with high power density
- Fast charge / discharge characteristics
- Wide operation temperature range
- Excellent durability / reliability
- Small self discharge
- Safe in use

ULTIMO

LAMINATED CELLS



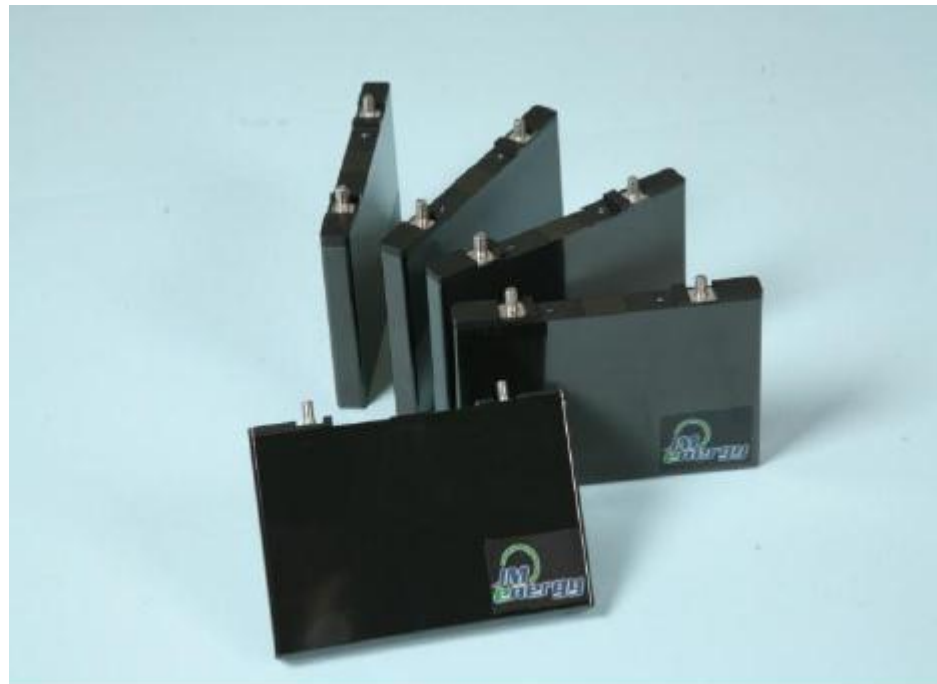
ULTIMO Laminated cells: Specifications

Measurement Items		1100F Ultra Low Resistance CLQ1100S1A	2200F Ultra Low Resistance CLQ2200S2A	Conditions
Range of Operating temperatures		-30° C~70° C	-30° C~70° C	
Rated Voltage	Max.	3.8 V	3.8 V	
	Min.	2.2 V	2.2 V	
Initial Characteristics	Capacitance	1100F	2200F	10CA constant current discharge, 25° C
	ESR	0.8 mΩ	0.5 mΩ	1kHz
	DC-IR	1.2 mΩ	0.7 mΩ	
	Weight E density	10 Wh/kg	10 Wh/kg	10CA constant current discharge, 25° C
	Volume E density	19 Wh/L	19 Wh/L	
Temp Dependence	-20° C	Capacitance	90%	10CA constant current discharge
	70° C	ratio (vs 25° C)	100%	
Self Discharge Characteristics		Voltage Reduction	<5%	3 months, 25° C
Cell Size		180x126x5.5mm	180x126x10.9mm	Without terminal
Weight		0.145 kg	0.275 kg	



ULTIMO

PRISMATIC CELLS



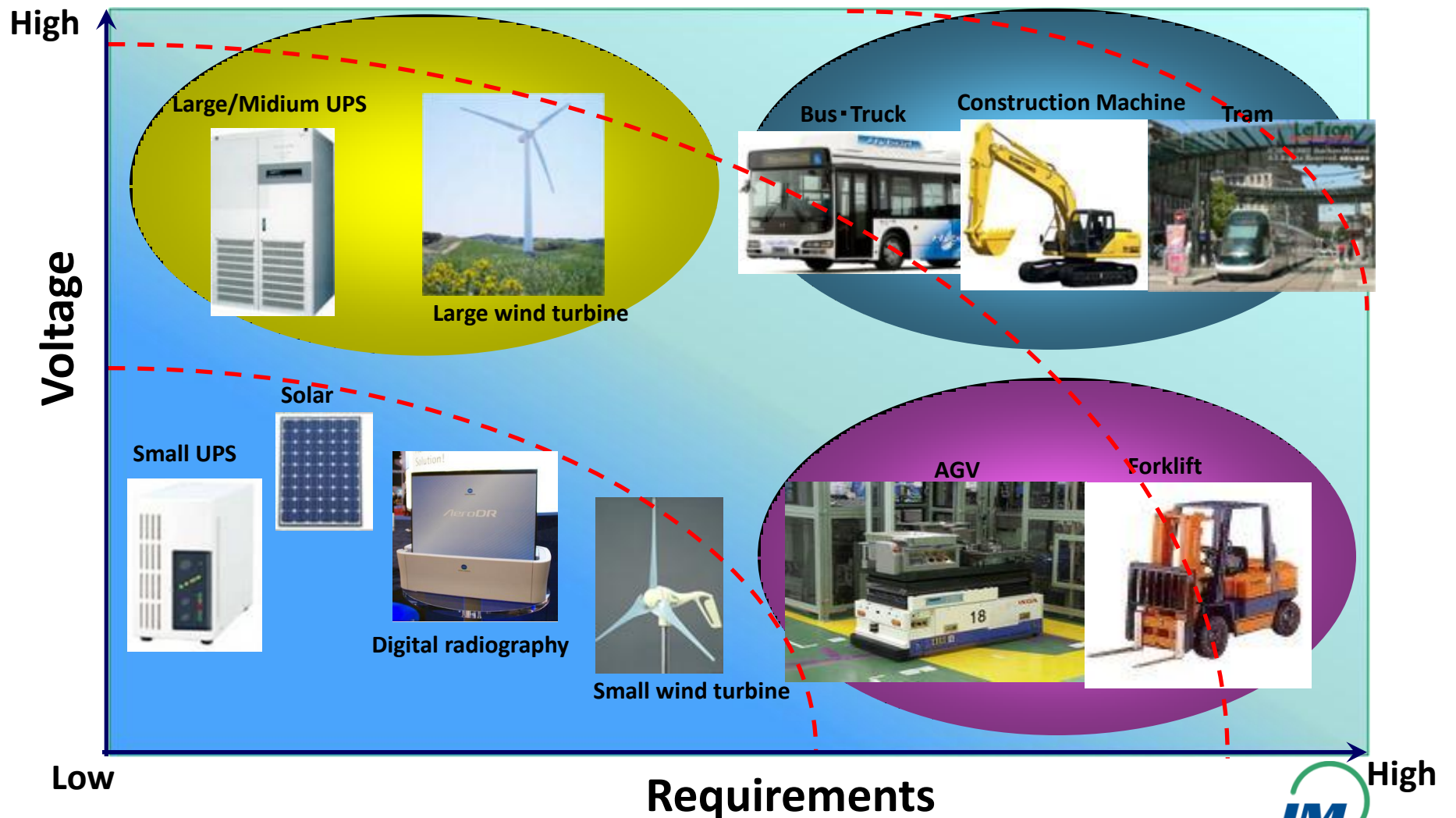
ULTIMO Prismatic cells: specifications

Measurement Items		2300F Ultra Low Resistance	3300F Low Resistance	Conditions
Range of Operating temperatures		-30° C~70° C	-30° C~70° C	
Rated Voltage	Max.	3.8 V	3.8 V	
	Min.	2.2 V	2.2 V	
Initial Characteristics	Capacitance	2300F	3300F	10CA constant current discharge, 25° C
	ESR	0.6 mΩ	0.7 mΩ	1kHz
	DC-IR	0.7 mΩ	1.0 mΩ	10CA constant current discharge, 25° C
	Weight E density	8 Wh/kg	12 Wh/kg	
	Volume E density	15 Wh/L	20 Wh/L	
Temp Dependence	-20° C	Capacitance ratio (vs 25° C)	90%	10CA constant current discharge
	70° C		100%	
Self Discharge Characteristics		Voltage Reduction	<5%	3 months, 25° C
Cell Size		150x91.5x15.5mm	150x91.5x15.5mm	Without terminal
Weight		0.365 kg	0.350 kg	



ULTIMO applications examples

Lithium Ion Capacitor Applications



■ **Transportation (Automotive – Racing - Bus – Railway...)**

- *Energy Recovery/Saving*
- *Fast charge*
- *Start/Stop – Reducing CO2 emission*
- *Peak Power absorption*
- *EV Recharge Station*



■ **Renewable Energy & Grid Quality**

- *Stabilization of Electric Power*
- *Peak Power Absorption*
- *Power Quality Improvement*
- *Harmonics Filtering*



■ ***Energy Regeneration***

- *Construction Machinery*
- *Forklift*
- *Harbor Cranes*



■ ***Back-up Power & Peak Assist***

- *UPS Voltage SAG Compensator*
- *Telecommunication Power Back-up*
- *Emergency Shut-off Larger Sized Manufacturing Equipment Protection*





Thank you !

Interested in learning more about our company?
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<http://www.jsrmicro.be>