



*Delivering structurally integrated power storage – ‘Strength with energy’*

The Paper Battery Company vision is to transform power management in the electronics industry with a flexible, patternable supercapacitor that can extend battery life by 15-25% without adding volume or weight to existing design and can replace batteries completely in some applications. The first product is the PowerPatch™, a thin, patternable supercapacitor module that can address the growing needs for high voltage, thin devices for local backup power in computing environments. These features provide significant competitive advantage in existing and emerging multi-million \$ opportunities. The market game changer is the transformational printed supercapacitor that is scalable in power, energy and voltage in a sheet format, and integrates directly into system structural elements such as printed circuit board layers, reducing component count and opening new applications and paradigms of power distribution and management in a broad array of electronics products.

**The company has demonstrated functional prototype samples validated with external testing, and is currently working with market-leading OEMs. The company is raising a current financing round to ramp production and get to first sales.**

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**INNOVATIVE TECHNOLOGY PLATFORM – PowerWrapper™** - integrates multiple power management components in a scalable power plane, with dynamic patterning to match the electronic layout footprints, including holes. Supercapacitor cells today have long cycle life and high power; the PowerWrapper™ is a fully printed, massively parallel array of these cells in a planar sheet. Bringing established print-forming and printed electronics technologies to transform supercapacitor production, the resulting high voltage packing efficiencies give **>30% higher capacity** compared to existing rigid supercapacitors. Roll to roll printing processes, and devices that are fully printed from particles to product, can scale to high volume, low cost, USA-based production.

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**BUSINESS STRATEGY:** Direct sales to OEMs will get to positive cash flow by 2015. **STAGED MARKET APPROACH:** PowerPatch™ product line (GEN1 technology) will be sold directly to OEMs as on-board integrated power modules. Technical discussions and tests are ongoing with market leading OEMs. A co-development R&D contract has also been signed with a leading medical diagnostic device company for wearable diagnostic sensor patches. Development partnerships for large consumer portable electronics and for specialty military and medical markets will be explored with commercial partners. The entry market opportunity (>\$300M /year) has a clear value proposition and customer interest. The production and technology platform will mature with partnerships for large volume consumer markets (>\$500M/yr) and larger format structural sheeting energy storage in transportation and grid applications.

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**PRODUCT BENEFITS:** PowerPatch™ supercapacitors with ultrathin formats can now be packaged into electronic devices where they can enhance performance of batteries and enable new end product applications, with distributed power management:

**Unique production method, patternable form factor and packaging efficiency gives unfair advantages over competition:**

- High voltage (5V-14V) and energy in an ultrathin (<3mm) format, scalable in voltage, power and energy in one package
- Patterned, scalable sheet that can be “cut to fit” as needed
- Tunable mechanical properties for load bearing capability

**Competitors:** Traditional rigid supercaps and batteries cannot scale in plane and voltage without increasing bulk; Batteries have a shorter cycle life (< 3,000); Thin-film printed primary batteries have low power capacity and are complementary to PowerWrapper™ based devices.

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**COMPETITION:** The scalable, patternable, ultrathin planar footprint with high voltage (5V-14V), needed in the emerging entry markets cannot be achieved with state of the art technology today. The first PowerPatch™ product will be much thinner than the closest competitor - a critical attribute in height-constrained circuit board applications. Thin devices have a 3X price premium today.

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**INTELLECTUAL PROPERTY:** Company-owned multiple patent applications filed on architecture, material interlocks and production processes filed; exclusive license to blocking RPI patent.

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**ACHIEVEMENTS TO DATE:** Seed capital of >\$1.5M from angel investors; Development contracts with NYSERDA; Laboratory alpha prototypes testing and development in progress; Co-development contract with medical R&D group;

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**MANAGEMENT:**

CEO Shreefal Mehta, PhD, MBA, successful entrepreneur with global business and commercial development experience.

CTO: Robert Miller PhD; Materials physicist, inventor on core patents in inkjet technology at HP and fuel cells at MTI Micro.

Corporate Advisory board includes senior execs from printed electronics roll to roll manufacturing, consumer electronics and battery industries, with startup and venture capital experience.

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**INVESTMENT and PARTNERSHIP OPPORTUNITY available.**

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