

“The Forever Battery: Making Today’s Batteries Obsolete... And Its Investors Wildly Wealthy.”

Batteries aren’t exactly what we remember them as- the old coppertop is sitting on the fine line of an all out extinction.

When we think about it, how much life can we *actually* get from a traditional battery? Can achieve a month or so of continuous use? The answer is mute because we are entering into a new era and batteries as we know them will “Forever” change.

Point is, as technology advances so does the need for more power; our products are demanding juice more than every before and instead of sitting and accepting this, there’s one company out there that is making a difference. The company is mPhase (XDSL.OB) and I will get more into that later, but first...

Batteries

From Wikipedia, a battery is “a device that stores chemical energy and makes it available in an electrical form. Batteries consist of electrochemical devices such as one or more galvanic cells, fuel cells or flow cells.”

Batteries generally fall within 2 different categories and beneath that, the tree goes on and on. The 2 categories are:

1. Primary Cells

Within the “Primary Cell” column sits batteries like:

- Alkaline
- Lithium
- Silver Oxide

2. Rechargeable or Secondary Cells

Within this second category is:

- Lead Acid
- Nickel-cadmium
- Zinc-bromine

Battery Life Cycles

The life cycle of secondary type batteries, which operate under normal or spec conditions, generally lasts between 500-800 charge-discharge cycles. In Layman's, this means approximately three years of battery life for the average user.

The Battery Timeline

1748: Statesmen and Inventor, Benjamin Franklin coined the term "Battery" describing an array of charged glass plates.

1800: Italian, Alessandro Volta constructed the voltaic pile, which was the first electric battery. Volta established that when metals and chemicals come into contact with each other they create an electrical current. Volta's creation was the first reliable and steady current of electricity created.

1836: Englishman, John F Daniel invented the very first fuel cell, which produced power with hydrogen and oxygen.

1859, The Birth of Secondary Cells: Gaston Plante, a Frenchman invented the first lead-acid battery that could be recharged.

1866: Engineer, Georges Leclanche of France, patented the carbon-zinc wet cell battery named the Leclanche cell.

1868: 20,000 of Leclanche's batteries were now functioning in telegraph equipment.

1881: The dry cell battery was invented by Carl Gassner.

1901: Thomas Edison invents the alkaline storage battery.

1949: The small alkaline battery was introduced by Lew Urry.

1954: The solar battery is invented by the trio; Gerald Pearson, Calvin Fuller and Daryl Chapin.

Current: The "Forever Battery" is launched by mPhase and proves old school batteries as obsolete.

Enter mPhase

mPhase Technologies Inc. (OTCBB: XDSL) develops and commercializes next-generation media-rich entertainment software and nanotechnology solutions, delivering novel systems to the marketplace that advance functionality and reduce costs.

Awards:

In 2005, they received the Frost & Sullivan Excellence in Technology Award; The Frost & Sullivan 2006 Energy Storage Award followed this for the Nanobattery in September;

And the Nano 50 Award from NASA Nanotech Briefs, for bringing nanotechnology out of the laboratory and into the market with a planned innovative long life power cell.

More recently in 2010, the company was featured in Popular Mechanics (March Edition) and was also written up by GQ magazine as “the best new tech of 2010”.

Additionally, the company is working on prototype ultra-sensitive magnetometers that promises orders of magnitude increases in sensitivity as compared with available un-cooled sensors.

At the front of nanotechnology research and development sits mPhase Technologies, Inc...

The company recently signed an extension of a research agreement with the U.S. Army Armament Research, Development, and Engineering Center (ARDEC) at Picatinny, New Jersey.

In a separate agreement with Rutgers, the State University of New Jersey is answering a significant challenge that is revolutionizing the battery industry. This challenge is simple; create a battery with an indefinite shelf life.

Thing is, the traditional battery is designed poorly and will eventually lose power when not in use, and in some cases, their juice is gone within a few years.

The mPhase technology keeps Nanobattery chemicals separate until they are needed. The uses for these types of technologically advanced batteries are endless...

Some could be used for emergency lighting systems or weapons systems. The idea here is that they might not be used for 10 years, but when the time comes, these instruments would require full power when needed- and that is what the “Forever Battery” provides.

In a clever use of viral marketing, mPhase's Smart Nanobattery breakthrough technology was explained on the popular video website, YouTube. (To access this video, follow [this link](#)).

The video is very informative and simply explains fundamental ideas behind the company's Smart Nanobattery.

mPhase has proven that it is possible to fabricate nanotech-based "smart" batteries, which can store reserve power for decades and generate electric current virtually in an “on demand” environment.

This battery is based on a discovery that liquid droplets of electrolyte will stay in a dormant state atop nano-textured surfaces until stimulated to flow. When the flow is stimulated, it thereby triggers a reaction producing electricity. This effect can allow exact control and activation of the batteries when required.

The Nanobattery from mPhase is set to revolutionize the battery industry for the first time in over 200 years.

The advantages of the nanobattery include the following:

- Long shelf life: 2 decades to infinity
- Easy to miniaturize
- Quick ramp up to full power
- Compatible with Semiconductor Processing
- High Power and Energy Density
- Wide range of chemistries can be used
- Inexpensive to mass produce

The new Smart Nanobattery architecture promises an energy source that can be packaged in various configurations, with shelf life potentially lasting decades, yet still able to be activated almost instantaneously on demand.

Various battery designs based on this technology may deliver a new and unique component for system design across many fields, including defense, industrial and consumer electronics.

mPhase Technologies' innovative magnetometer designs exhibit a level of sensitivity unparalleled by commercial magnetometers. Acting much like a miniature tuning fork or oscillator, with movements only perceptible under a microscope, the magnetometer prototype detects changes in magnetic fields, which is important in many applications that need to establish direction of movement of magnetic objects.

Initial applications for such magnetometers are centered on national defense and homeland security. Among civilian uses might be sporting venues, where physical bag searches could be eliminated to speed security screenings in high-traffic entrances. The technology also lends itself to enhancing mobile phone global positioning (GPS) capabilities with direction-finding applications.

“The world has changed and we must change with it,” Mr. Durando, President, Chief Executive Officer and Director of mPhase said. “This also includes our view of national security issues. The major threats today come not from nations but from individuals from rogue elements. This increased understanding dovetails importantly with the increased sensitivity of our products tasked with homeland security applications. For this reason, we have chosen to compartmentalize our smart nanobattery and magnetometer activities into an independent company and to devote significant resources to their manufacturing and deployment,” he continued.

In February of 2004, mPhase entered the business of developing new products using the science of nanotechnology. Such science involves the manipulation of materials of extremely small size (of a magnitude equal to one fifty thousandth the size of a human strand of hair) that as a result demonstrate new and different properties from their ordinary properties found in nature. This involves interdisciplinary areas of science including molecular engineering, quantum physics and electrochemistry.

The Company commenced its efforts by entering into a 12 month \$1.2 million Development Agreement with the Bell Labs division of Alcatel/Lucent for exploratory research of control and manipulation of fluids on super hydrophobic surfaces to create power cells (batteries) by controlling wetting behavior of an electrolyte on nano-structured electrode surfaces.

It is believed that such batteries with no direct electrode contact (meaning no power drain prior to activation) should have a shelf life of 15-20 years as compared to 5 years for an ordinary battery.

Such a battery will have a significant advantage in the time it takes to ramp up power because the charge is equal to one millisecond for it to have fully active voltage- which is a fraction of the time it takes for conventional batteries.

The Company's Development Agreement covering power cell development with Bell Labs was extended in March of 2005 and April of 2006 respectively each for additional 12-month periods.

Upon expiration in March of 2007, Company and Bell Labs entered into an interim agreement at a cost of \$200,000 covered the period from March 1, 2007 through April 27, 2007.

A second interim agreement entered into covered the period from April 27, 2007 through July 31, 2007 for a total of \$300,000 and has recently expired. The Company is currently negotiating a further extension of such product research and development.

In March of 2005, the Company entered into a second Development Agreement using the science of nanotechnology for 12 months at a cost of \$1.2 million with the Bell Labs to develop ultra sensitive magnetic sensor devices through the science of nanotechnology.

Such agreement was renewed in April of 2006 for another 12 months requiring mPhase to pay Bell Labs the sum of \$100,000 per month for exploratory research. The Company is currently negotiating the renewal for an additional 12 months at a total cost of approximately \$1.2 million.

Magnetometers work by sensing changes in the earth's magnetic field caused by motion of magnetic objects or changes in electrical currents generated by such objects. The Company believes that magnetic sensors may have significant applications in the area of military electronics, cell phones, the food industry and electronic security and detection devices.

The family of magnetometers that mPhase is developing in collaboration with Lucent Bell Labs is based upon Micro Electrical Mechanical Systems (MEMS). This is a development technique using a combination of photolithography and etching with extremely small three-dimensional structures, with the capabilities of movement, can be made on a wafer of Silicon.

The processing of such devices is done in a semi-conductor clean room located at the New Jersey Nanotechnology Consortium facilities in Murray Hill, New Jersey. The

product development has successfully reached an early milestone having produced a number MEM's based sensor samples from the clean room facilities.

The company is currently working on integrating sensor samples into the surrounding electronic circuitry so that measurement, characterization and sensitivity testing can be conducted. MPhase is currently able to achieve sensitivities at room temperature of better than .1 micro gauss per root hertz squared and with additional development the goal is improvement of at least one order of magnitude.

The discipline of developing new products utilizing nanotechnology fabrication is in its early stages of exploratory development making it difficult to predict the timing of product releases and future revenues.

mPhase believes that batteries with exceptionally long shelf lives, very small size and high power density as well as electromagnetic sensors may be some of the first products resulting from nanotechnology research and development to achieve commercial viability.

They believe that such expansion into nanotechnology product development is consistent with its strategy of being a pioneer of high growth technology products and potentially diversifies its product mix.

Battery Demand

The global battery market is about \$50 billion, of which roughly \$5.5 billion is allocated to rechargeable (secondary) batteries.

The rechargeable battery market has four major battery types:

Lead Acid

\$30 billion a year market.

Used in motive power applications like automobiles, trucks, golf carts, etc.

Lithium Ion (Li Ion)

\$5 billion a year market.

Principally used in portable devices like cell phones and PCs

Nickel Cadmium (NiCd)

\$1 billion a year market

Used in power tools and smaller specialty markets

Nickel Metal Hydride (NiMH)

\$1 billion a year market

Deployed principally in power tools, cordless phones and smaller specialty markets

The U.S demand is forecasted to increase 4.3 percent annually through 2011 to \$14.9 billion.

Cellular telephones and other devices that require increased performance with reduced battery size are pushing the mix toward more expensive batteries.

Increasing production of high-performance battery products will drive these gains, especially lithium and nickel metal hydride (Ni-MH) types, due to the enormous popularity of high-drain portable electronic devices

“In the coming years, the nanotechnology category will evolve into a trillion dollar industry,” Mr. Durando said, “and we are re-structuring accordingly to be well-positioned in the marketplace, to streamline our operational activities and to leverage our existing synergistic relationships with such leading academic and research institutions as Rutgers, the State University of New Jersey; and such defense-oriented entities such as Lockheed Martin, Northrop Grumman and the U.S. Army Armament Research, Development, and Engineering Center (ARDEC) at Picatinny, New Jersey.”

“Forever Battery” Can Also Power...

Hybrid vehicles capable of getting 150 MPH

Electronic motorcycles that goes from 0-60 in 1.4 seconds- using a safer nanophosphate based lithium ion battery as opposed to the typical cobalt oxide makeup.

Cordless power tools- twice as strong as plugged in versions and 5 times more powerful as traditional battery power ones.

Battery powered fabrics that will let soldiers plug electronics into their uniforms- like night vision goggles.

Because of nano materials are so small and flixable- there is also a high demand in the field of RFID. Now companies can track assets for longer periods of time without having to spend resrouces replacing the tags.

mPhase and Lucent Technologies bring Nanotechnology to Market

mPhase Technologies has entered into a broad sales, marketing and development partnership with Lucent Bell Laboratories to commercialize nanotechnology for new batteries.

MPhase is committed to bringing this technology to the marketplace within the next 18 to 24 months. Nanotechnology will enable military applications, consumer products and advanced systems with amazing new capabilities for long life and miniature size because of its unique characteristics

Traditional Reserve Battery Technology

According to mPhase, “many applications require a reserve battery. Typical implementations use a mechanical mechanism to combine the materials to create the battery. These technologies have a long shelf life, high reliability, high power densities, wide range of chemistries and wide operational range. But they suffer from:

Cannot be easily miniaturized

Incompatible with semiconductor processes (Cannot be integrated onto “chips”.)

Based upon mechanical activation, are slow to ramp up power

Have to maintain separate electrolyte storage and activation mechanism taking up internal space

Often are expensive.”

Nanotechnology Will Enable Unlimited Shelf Life Batteries

A battery depends upon a chemical reaction. A variety of chemistries can be used. Nanotechnology provides a unique mechanism to combine the chemicals and control the characteristics of the reaction.

The image is a representative example of “nanograss” tubes. These tubes provide a “Superhydrophobic NanoStructured Surface” atop of which can be placed a droplet.

The droplet sits above the tubes with little or no interaction with the tubes themselves. But by careful engineering the droplet can be made to fall within the space between the

tubes encountering a greatly increased surface area and interacting with the tubes themselves to causing current to flow...the drop can be engineered to occur upon a variety of stimuli: voltage, RF and/or others.

In The End

In the end, we believe that the battery industry will be revolutionized with mPhase's design and that means a couple of things.

For starters, the sheer uses for an amazing battery like the “Forever Battery” is limitless. We'll see it in all kinds of industrial, military and homeland security and consumer based uses on a global scale.

We'll most likely see a shift from conventional “primary” and “secondary” cell batteries over to this new type of power source.

Secondly, you as investors will be the ones feeling this the most. The potential behind this kind of technology is huge and mPhase is the place to be. Being that the company is a small cap, the potential really starts to widen as we know as soon as quarterly reports move in with increased earnings, gains of 200-600% are somewhat customary.