ALTAIR NANOTECHNOLOGIES INC
Form 10-K
March 14, 2008

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE FISCAL YEAR ENDED DECEMBER 31, 2007

[ ] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE TRANSITION PERIOD FROM ______________ TO ______________

ALTAIR NANOTECHNOLOGIES INC.
(Exact name of registrant as specified in its charter)

Canada	1-12497	33-1084375
(State or other jurisdiction of incorporation)	(Commission File No.)	(IRS Employer Identification No.)

204 Edison Way
Reno, Nevada 89502-2306
(Address of principal executive offices, including zip code)

Registrant's telephone number, including area code: (775) 856-2500

Securities registered pursuant to Section 12(b) of the Act:

Common Shares, no par value	NASDAQ Capital Market
(Title of Class)	(Name of each exchange on which registered)

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark whether the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES [ ] NO [X]

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. YES [ ] NO [X]

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES [X] NO [ ]

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Report or any amendment to this Report. [ ]

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer. See definition of " accelerated filer " and " large accelerated filer " in Rule 12b-2 of the Exchange Act (Check one):

Large accelerated filer [ ] Accelerated filer [X] Non-accelerated filer [ ]

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act): YES [ ] NO [X]

The aggregate market value of the common shares held by non-affiliates of the Registrant on June 30, 2007, based upon the closing stock price of the common shares on the NASDAQ Capital Market of $3.54 per share on June 30, 2007, was approximately $198,229,173. Common Shares held by each officer and director and by each other person who may be deemed to be an affiliate of the Registrant have been excluded.

As of March 10, 2008, the Registrant had 84,356,301 common shares outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Proxy Statement on Schedule 14A for the Registrant's 2008 Annual Meeting of Shareholders are incorporated by reference in Part III as specified.

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PART I

This Annual Report on Form 10-K for the year ended December 31, 2007 (this “Report”) contains “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), that involve risks and uncertainties. Purchasers of any of the common shares, no par value, (the “common shares”) of Altair Nanotechnologies Inc. are cautioned that our actual results will differ (and may differ significantly) from the results discussed in the forward-looking statements. Factors that could cause or contribute to such differences include those factors discussed herein under “Item 1A. Risk Factors” and elsewhere in this Report generally. The reader is also encouraged to review other filings made by us with the Securities and Exchange Commission (the “SEC”) describing other factors that may affect future results of the Company.

Unless the context requires otherwise, all references to “Altair,” “we,” “Altair Nanotechnologies Inc.,” or the “Company” i this Report refer to Altair Nanotechnologies Inc. and all of its consolidated subsidiaries. Altair currently has one wholly owned subsidiary, Altair US Holdings, Inc., a Nevada corporation. Altair US Holdings, Inc. directly or indirectly wholly owns Altairnano, Inc., a Nevada corporation, Mineral Recovery Systems, Inc., a Nevada corporation (“MRS”), and Fine Gold Recovery Systems, Inc., a Nevada corporation (“Fine Gold”). AlSher Titania LLC, a Delaware limited liability company, is 70% owned by Altairnano, Inc. We have registered or are in the process of registering the following trademarks: Altair Nanotechnologies®, Altair Nanomaterials®, Altairnano™, TiNano®, Nanocheck® and RenaZorb®. Any other trademarks and service marks used in this Report are the property of their respective holders.

Item 1: Business

We are a Canadian corporation, with principal assets and operations in the United States, whose primary business is developing and commercializing nanomaterial and titanium dioxide pigment technologies. We are organized into three divisions, a Power and Energy Group (formally known as the Advanced Materials and Power Systems Division), a Performance Materials Division, and a Life Sciences Division. Our research, development, production and marketing efforts are currently directed toward three primary market applications that utilize our proprietary technologies:

- Power and Energy Group
  - The design, development, and production of our nano lithium Titanate battery cells, batteries, and battery packs as well as related design and test services.
  - The development, production and sale for testing purposes of electrode materials for use in a new class of high performance lithium ion batteries called nano lithium Titanate batteries.

- Performance Materials Division
  - Through AlSher Titania, the development and production of high quality titanium dioxide pigment for use in paint and coatings, and nano titanium dioxide materials for use in a variety of applications including those related to removing contaminants from air and water.
  - The testing, development, marketing and/or licensing of nano-structured ceramic powders for use in various application, such as advanced performance coatings, air and water purification systems, and nano-sensor applications.

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- Life Sciences Division
  - The co-development of RenaZorb, a test-stage active pharmaceutical ingredient, which is designed to be useful in the treatment of elevated serum phosphate levels in human patients undergoing kidney dialysis.
  - The development of a manufacturing process related to a test-stage active pharmaceutical ingredient, which is designed to be useful in the treatment of companion animals.

We also provide contract research services on select projects where we can utilize our resources to develop intellectual property and/or new products and technology. In the near term, as we continue to develop and market our products and technology, contract services will continue to be a substantial component of our operating revenues. During the years ended December 31, 2007, 2006 and 2005, contract services revenues comprised 55%, 67%, and 70%, respectively, of our operating revenues. In the summary of our business below, we describe our various research products in connection with our description of the business segment to which each relates.

Our Proprietary Nanomaterials and Pigment Process

Most of our existing products, potential products and contract research services are built upon our proprietary nanomaterials and titanium dioxide pigment technology. We acquired the basis for this technology from BHP Minerals International, Inc. in 1999 and, over the past seven years, have continued to expand and refine various applications of the technology. Today, we use the technology in order to produce various finely-sized powders that have current or potential applications in a wide range of industries, including pharmaceuticals, titanium dioxide pigment, and high performance rechargeable batteries. Although the existing and potential applications are varied, each is directly or indirectly built upon the ingenuity of our management, research and development staff and engineering team and our proprietary nanomaterials and titanium dioxide pigment technology.

This nanomaterials and titanium dioxide pigment technology enables our production of conventional titanium dioxide pigment products that are finely sized powders consisting of titanium dioxide crystals. These powders approximate 170-300 nanometers in size. This technology is also capable of producing titanium dioxide and other metal and mixed metal oxide nanomaterials. These are specialty products with a size range of 10 to 100 nanometers (approximately one tenth the size of conventional titanium dioxide pigment). The primary products currently being produced in the processing plant are titanium dioxide, lithium titanate spinel, and lanthanum products.

Using this technology, we are in various stages of research, development and marketing of numerous products and potential products. We also use this technology to provide contract research services on select projects where we can utilize our resources to develop intellectual property and/or new products and technology.

Power and Energy Group

Primary Products

Nano lithium Titanate batteries and electrode materials

We are developing, marketing, producing and selling our proprietary rechargeable lithium ion battery, which we have branded as our nano lithium Titanate batteries. We are also seeking to develop, license, manufacture and sell our proprietary lithium titanate spinel (“LTO”) electrode materials for use in batteries being developed by other companies.

As explained in greater detail below, principal features used to compare rechargeable batteries including power, discharge rates, energy density, cycle life, calendar life and recharge time. In laboratory and field tests, our nano lithium Titanate batteries have exhibited power, rates of charge, operating temperature range, cycle life, and expected calendar life that far exceed those of rechargeable batteries currently being used for target applications. We believe that with these strengths our nano lithium Titanate batteries are superior alternatives for rechargeable battery uses that require power, durability and exposure to the elements. These include all types of electric automobiles, electric utility services and uninterruptible power supplies.

Key Business Developments in Power and Energy

Phoenix Relationship. In January 2007, we entered into a multi-year purchase and supply agreement with Phoenix Motorcars, Inc., succeeded by Phoenix MC, Inc. (“Phoenix”), for lithium nano lithium Titanate battery packs to be used in electric vehicles produced by Phoenix. Contemporaneously, Phoenix placed firm purchase orders for 35KWh battery pack systems valued at $1,040,000 and placed an indicative blanket purchase order for up to 500 battery pack systems to be delivered during 2007 (projected value at the time between $16 and $42 million). The second release order valued at $2,210,000 was placed in May 2007. Due to a slow down in production relating primarily to delays in Phoenix obtaining funding, projected orders for 2007 of between $16 and $42 million for 2007 were not achieved.

After title passed to Phoenix for the first-generation battery packs produced under the two release orders, internal testing and modeling revealed a module configuration problem. Our research indicated that the manner in which battery modules within the battery packs were configured could, under certain rare circumstances, cause battery modules within the first-generation battery packs to overheat and fail. The configuration issue relates specifically to the configuration and structure of the first-generation electric battery packs and does not indicate an issue in our core lithium Titanate cell technology or in our battery modules for stationary applications, which are of a completely different design. We met with Phoenix and presented several work-arounds to ensure safe use of the first-generation battery packs. Unable to define an acceptable work-around, we agreed to replace 47 of the existing packs sold to Phoenix by means of a credit against re-designed second-generation battery packs and related engineering services. Modeling and design of the modules for the second-generation battery packs is substantially complete. Once testing and computer modeling confirm that the revised design resolves the potential overheating issue, we expect to commence delivery of second-generation battery packs to Phoenix. We are currently negotiating a development and supply agreement with Phoenix.

AES Relationship. In July 2007, we entered into a multi-year development and equipment purchase agreement with AES Energy Storage, LLC (“AES”), a subsidiary of global power leader The AES Corporation. The AES Corporation is one of the world’s largest power companies, with operations in 28 countries on five continents. The AES Corporation generation and distribution facilities have the capacity to serve 100 million people worldwide. Under the terms of the deal, we are working jointly with AES to develop a suite of energy storage solutions specifically for AES. These energy storage products are expected to deliver in excess of 1 megawatt of power and 500 kilowatt-hours of energy. We are working with AES to apply these products and systems at strategic points within the electrical grid to more efficiently deal with congestion, peak energy consumption, and real-time fluctuations in electricity supply and demand. We believe that the quick response time, extended life, and power profile of our batteries and energy storage products are well suited to improving performance in these areas with lower environmental impact than traditional generation solutions.

On August 3, 2007, we received an initial $1,000,000 order in connection with the AES Joint Development and Equipment Purchase Agreement for a 500 kilowatt-hour energy storage product. In accordance with this purchase order, two 1 megawatt stationary battery packs (energy equivalent for each pack based on anticipated operational time is 250 kilowatt-hours of energy each) were manufactured in Indiana and completed according to the delivery schedule in December 2007. This initial product is intended for use as a short-term duration buffer to regulate the frequency and voltage of the electrical utility system grid. This buffering is called Regulation Services, and it serves to smooth the short term supply-demand imbalances inherent in power generation and delivery, thereby improving the quality of power delivered. The stationary battery packs have been connected to the electrical grid and full testing has commenced. Assuming the successful testing of these packs, we expect our development relationship with AES to continue through 2008.

Alcoa Relationship. In September 2006, we signed an agreement with Alcoa's AFL Automotive business to jointly develop a battery pack system. This collaboration brings together our innovative nano lithium Titanate battery technology and AFL Automotive's expertise in vehicle electrical distribution systems, power management electronics and its substantial presence as a world renowned supplier to the automotive market. AFL Automotive is also a major supplier of lightweight, high strength aluminum components to the automotive industry. The agreement provides for the delivery of an integrated battery pack system for the medium-duty hybrid truck market using our nano lithium Titanate battery technology and AFL Automotive's electrical interconnect and application technology to integrate the battery pack system into the vehicle's electrical architecture. The scope of the joint development agreement involved system design, development and prototyping. During the development and prototyping phase of this agreement, each party was responsible for its own costs and expenses. Any revenues received in connection with the sale of the prototype battery would be shared based on the proportion of documented costs incurred in connection with this project. No significant revenues or expenses were incurred in connection with this agreement in 2006 or 2007. Based on work performed to date, both parties informally agreed in 2007 to shift focus from a product designed for the medium-duty hybrid truck market to a specialty power application. After reviews of a specialty cell and new pack concept that we are proposing are completed by ALCOA, we expect to negotiate a new development agreement by the third quarter of 2008.

Department of Energy Contracts. On September 9, 2006, approval was finalized on the $2.5 million grant received from the U.S. Department of Energy. Of the $2.5 million, $2.4 million will be available, after the deduction of administrative fees, to fund research for the following programs: Battery technology, Nanosensors, and Nanomaterials characterization. This is a prime grant under which we are directly responsible for the contract administration. The Nanosensors and Nanomaterials characterization programs are discussed subsequently under the related divisions. The battery technology program consists of two objectives, 1) Design, Synthesis, and Testing of Li-ion Hosts for Cathode Service and 2) Development, Testing, and Demonstration of High Rate Low Temperature Lithium Ion Battery, funded in the amounts of $508,000 and $606,000 respectively in 2006. Objective 1 under the grant continues research on optimized anode and cathode materials for high power, safe, fast charge batteries. The agreement anticipates that this work will be accomplished over 24 months. This research will also extend the collaboration with Rutgers University for prototype cell testing. Objective 2 furthers the investigation of extreme temperature range battery performance and extends over 12 months. During 2007, the program associated with objective 2 was extended through September 2008. Of this grant, $1,114,000 is allocated to the battery optimization program. Work continues as planned under these objectives. Through December 31, 2007 $706,865 in revenue has been recognized in connection with this grant.

Target Markets

According to information supplied by JMP Securities in January 2007, the market for power storage devices is approximately $55 billion ($31 billion lead acid, $9 billion alkaline, $8 billion lithium ion, and $7 billion all other). Lithium ion and advanced technology rechargeable batteries are expected to gradually increase their share of the world rechargeable battery market. New developments indicate that high power batteries of this type will ultimately be developed for application as replacements for lead acid batteries and Nickel Metal Hydride, or NiMH, batteries in automobiles, electric vehicles, and hybrid electric vehicles where direct electrical energy for starting and passing will assist the gasoline engines. Also, the development of power storage systems for stationary power, electric utility grid services and wind, fuel cell and solar generation systems will require enhanced battery capabilities.

Our technology provides a fundamental building block for a new generation of rechargeable batteries. Currently our primary markets are in the electric vehicle sector and electric utility grid services. As discussed above, we have an active development and supply relationship with Phoenix for electrical vehicle battery packs and AES in the electrical grid market. We have also provided electrode materials, cells, batteries and battery packs to, and had early stage discussions with, various established automobile companies that are evaluating our technology for use in hybrid electric vehicles and plug-in electric vehicles. These discussions could lead to commercial relationships that will be characterized by a revenue stream consisting of one or more of development funding, materials manufacturing and royalties.

We are focusing our marketing and development efforts on markets presently dominated by Nickel Cadmium, or NiCd, and Nickel Metal Hydride, or NiMH, batteries, such as automobiles, in which rapid charging, long cycle life and the additional power from the rapid discharge should prove advantageous and in stationary power applications such as electric grid services and uninterruptible power supply, where rapid charging, long calendar life, low maintenance, tolerance to temperature extremes and power resulting from rapid discharge should prove advantageous.

Key Features

Rechargeable batteries are made from various materials, each of which has certain characteristics or tendencies, depending upon how the products are configured. Some of the key concepts used when comparing rechargeable batteries include the following:

- Power: A battery’s power rating is its ability to deliver current while maintaining its voltage.
- Discharge: Discharge refers to the dissipation of a battery’s stored energy as a result of intended transfer of that energy (either gradually or in one or more large bursts) or as a result of the unintended leakage of that energy. This latter type of leakage is referred to as “self discharge” and is a natural tendency of all batteries at a rate that is proportional to temperature. A “deep discharge” refers to the discharge of substantially all of the stored energy in a battery between recharges. In general, deep discharges reduce the cycle life of batteries.
- Energy density: A battery’s energy density relates to the total unit volume of materials comprising a battery that will deliver a watt-hour of energy. A battery with high energy density will deliver more energy per unit volume than a battery with lower energy density.
- Cycle life: The ability of a rechargeable battery to accept a charge tends to diminish as a result of repeat charge/discharge cycles. A battery’s “cycle life” is the number of times it can be charged and discharged without a significant reduction in its ability to accept a charge.
- Calendar life: A battery’s calendar life relates to the period of time that a battery will preserve its capability to deliver a significant portion of its newly built energy storage capacity.
- Recharge time: Recharge time is the minimum amount of time it takes to replenish a battery’s energy.

Other important factors include the cost, safety, environmental friendliness and extreme temperature performance of a battery. Although being on the positive side of each of the characteristics is desirable in all rechargeable batteries, the importance of these various characteristics depends primarily upon the anticipated use of a battery. For example, high power, which is important in a hand-held cordless power tool is not very important in a battery designed to power a cell phone because a cell phone needs very little power; however, high specific energy density may be important in a cell phone battery because consumers desire to be able to use a cell phone for a long time between recharge and want to carry as little weight and volume as possible.

The principal advance we have made is in the optimization of nano-structured lithium LTO electrode materials that replace graphite electrode materials used in the negative electrode of current lithium ion batteries. When used with a positive electrode from a common lithium ion battery, battery cells operate at very high charge and discharge rates. Our current non-optimized cells are capable of recharge times of 10 minutes to 90%, or more, of initial battery capacity and 10 minute discharges with 90%, or more, capacity utilizations.

Our nano-structured LTO is non-reactive with the electrolytes used in common lithium ion systems. This greatly reduces the negative electrode resistance, and thus, passage of lithium ions to the electrode surface. Since the material is nano-structured, the surface area available to lithium ions is greatly enhanced – by up to 100 times – over graphite based systems. The material allows for a greatly facilitated, thus rapid, access to the active sites necessary for battery function. In addition, the small size of the nanoparticles dramatically reduces the distance from the surface to inner active sites, further reducing resistance to high rate operation. These characteristics permit our battery cells to deliver more power and recharge much faster than other types of rechargeable batteries described in the subsection entitled “Competition” below.

Our nano-structured LTO is termed a zero strain material, meaning that the material essentially does not change shape upon the entry and exit of a lithium ion into and from the particle. Since most battery materials suffer from this mechanical stress and strain (this particle fracturing reduces the life of the battery), battery calendar life and cycle life is greatly enhanced using our nano-structure LTO. In January 2007, we completed 25,000 deep charge/discharge cycles of our innovative battery cells. Even after 25,000 cycles the cells still retained over 80% of their original charge capacity. This represents a significant improvement over conventional, commercially available rechargeable battery technologies such as lithium ion, NiMH and NiCD. These other commercially available rechargeable batteries typically retain that level of charge capacity only through approximately 1,000 deep charge/discharge cycles. Nano-structured LTO offers a near-term promise of lithium nano-titanate batteries that exhibit rapid charge and discharge, longer cycle life and safer performance than either currently available NiMH or lithium ion batteries. These results support the feasibility of a power lithium nano-titanate battery pack half the size of those currently being tested for hybrid electric vehicle applications.

Our nano-structured LTO also represents a breakthrough in low- and high-temperature performance. Nearly 90% of room temperature charge retention is realized at -30°C from Altair’s nano-structured LTO cells. In contrast, common lithium ion technology possesses virtually no charging capabilities at this low temperature, and the other rechargeable battery types described in the subsection entitled “Competition” below take 10 to 20 times longer to charge at this low temperature.

We are also testing the safety of batteries made using our nano-structured LTO. Graphite negative electrode materials used in typical lithium ion batteries are known to suffer from thermal runaway issues at temperatures above 130°C, while lithium titanium spinel oxides are known to be safe for an additional 120°C or up to temperatures of about 250°C. In May 2006, we completed a safety testing cycle for lithium ion battery products using our nano-structure LTO that replaces the graphite used in “standard” lithium ion batteries. In the safety testing cycle, we subjected our batteries to temperatures up to 240o C, which is more than 100o C above the temperature at which graphite-based batteries can exhibit thermal run away and explode. In addition, we performed high-rate overcharge, puncture, crush, drop and other comparative tests alongside a wide range of graphite-based battery cells with no malfunctions, explosions or safety concerns exhibited by our nano-structured LTO cells. In comparison, the graphite cells, put to the same tests, routinely smoked, caught fire and exploded.

We recently discovered a potential problem with the configuration of modules comprising the first-generation battery packs sold to Phoenix. In the first-generation battery packs, 48 individual cells comprise one module, and 28 modules comprise one battery pack. The configuration problem was discovered by our researchers in the course of an exhaustive testing and computer modeling process to investigate possible modes of potential failure in our battery modules. Their analysis revealed that, under certain rare circumstances battery modules as configured for use in Phoenix vehicles, might overheat and fail. This potential problem relates specifically to the configuration and structure of the first-generation electric battery packs and does not indicate an issue in our core lithium Titanate cell technology or in our battery modules for stationary applications, which are of a completely different design. We have substantially completed the modeling and design of the modules for the second-generation battery packs for delivery to Phoenix that we expect will eliminate the overheating risk.

The current generation of batteries made with our nano-structured LTO exhibit lower energy density at room temperatures. If density is measured by weight, our batteries made with our nano-structured LTO have energy densities that are better than lead acid, NiCd and NiMH batteries and approximately 70% of conventional lithium ion batteries. This indicates that our lithium Titanate batteries may be more suited to power applications that are not limited as to physical size of the battery as opposed to consumer product uses such as cell phones and laptop computers.

Proprietary Rights

We have been awarded four U.S. and several international patents protecting this technology including: 1) Method for producing catalyst structures, 2) Method for producing mixed metal oxides and metal oxide compounds, 3) Processing for making lithium titanate, and 4) Method for making nano-sized and sub-micron-sized lithium-transition metal oxides. The U.S. patents expire in 2020, 2021 and 2022.

We have filed five U.S. patent applications directed to a variety of inventions related to aspects of our electrochemical cells: “Nano-Materials – New Opportunities for Lithium Ion Batteries”; “Methods for Improving Lithium-Ion Battery Safety”; “Method for Preparing a Lithium-Ion Cell”; “Method for Preparing a Lithium-Ion Battery”; and, “Method for Synthesizing Nano-Sized Lithium Titanate Spinel.”

Competition

Advanced Lithium Ion Batteries. We are not aware of any commercial products available with the same characteristics as our nano-structured LTO and our nano lithium Titanate batteries and battery packs. A competitor company has recently announced an advanced Li-Ion battery. This battery appears to have some advantages over other types of common Li-Ion batteries, but appears to lack certain features, such as cycle life and performance at temperature extremes, that distinguish our batteries from the competition. In addition, we believe, many large companies, such as automobile manufacturers, are attempting to develop lithium ion batteries that are suitable for high-power applications such as hybrid electric vehicles and plug-in hybrid electric vehicles. Many of these companies have significant human and financial resources, a well-known brand name, existing distribution channels and other advantages over us. Were such companies to develop a product technology with features that are similar or superior to those of our nano lithium Titanate batteries, that company would have a significant competitive advantage.

Existing Technologies. Lead acid, NiCd and NiMH batteries presently dominate our target markets. Lead acid batteries are used everyday by anyone who drives an automobile or operates an electric-powered wheel chair, scooter or golf cart. They are also the battery-of-choice for uninterruptible power supplies. Lead acid batteries are an inexpensive, relatively simple to manufacture, mature, reliable technology that possesses a relatively low self discharge rate. The modern sealed versions also need little or no maintenance. However, lead acid batteries are quite heavy, giving them very poor weight to energy and power ratios, which limit practical use to stationary and transportion applications. They also suffer from long recharge times, relatively low energy capacities and cannot be stored for long periods in a discharge state without service-life failure. In addition, they possess a very limited deep discharge cycle life, and thermal runaway can occur with improper charging. The highly toxic metal, lead, and highly corrosive sulfuric acid used in lead acid batteries render them environmentally unfriendly.

NiCd batteries are inexpensive and fairly rugged, have the longest cycle life of currently available rechargeable battery types, work best on deep discharge cycles and accept recharge at moderately fast rates; however, charging rates must be reduced by a factor of 5 to 10 at temperatures below 0°C (32 °F) and above 30°C (86°F). On the other hand, NiCd batteries suffer from relatively low energy density and relatively high self-discharge rates necessitating re-charge after moderate periods of storage. More seriously, NiCd batteries are exceedingly environmentally unfriendly. The metal cadmium is toxic and can cause several acute and chronic health effects in humans, including cancer. As a result, NiCd usage is being severely restricted and/or phased-out altogether by some countries.

The metal hydride used in NiMH technology is a direct replacement for cadmium in NiCd batteries. Thus, NiMH batteries share and improve upon the attributes of NiCd batteries, yet introduce problems of their own. On the positive side, NiMH batteries improve upon the energy capacity and power capabilities of NiCd (for the same size cell) by 30% to 40%. Since they contain only mild toxins, NiMH batteries are more environmentally friendly than both lead acid and NiCd batteries. Like NiCd batteries, NiMH batteries can be charged in about 3 hours. Charging rates must be reduced by a factor of 5 to 10 at temperatures below 0°C (32°F) and above 40°C (104°F). NiMH batteries suffer from poor deep cycle ability, possessing a recharge capability of the order of 200 to 300 cycles. While NiMH batteries are capable of high power discharge, dedicated usage in high current applications limits cycle life even further. Shelf life is poor - on the order of three years. As noted above, NiCd batteries possess high self-discharge rates, but this problem is exacerbated by up to 50% in NiMH systems. NiMH batteries are intolerant to elevated temperature and, as a result, performance and capacity degrade sharply above room temperature. The most serious issue with NiMH involves safety accompanying recharge. The temperature and internal pressure of a NiMH battery cell rises sharply as the cell nears 100% state of charge, necessitating the inclusion of complex cell monitoring electronics and sophisticated charging algorithms in order to prevent thermal runaway. While NiMH technology is gaining prominence within the electric vehicle (EV) market and dominates the hybrid electric vehicle market, this gain is placing pressures on the limited supply of nickel, potentially rendering the technology economically infeasible for these applications as the demand continues to rise.

Of all of the available metals for use as a basis for practical batteries, lithium is the most reactive and least dense, allowing for batteries with high specific energy. Conventional lithium ion batteries exhibit voltages of about 3.6V as compared to about 1.2V for NiCd and NiMH and 2.0V for lead acid. There is a relationship between power P, voltage V and current I. This relationship is best summarized by this formula: P=IV. Power is also defined as the time rate of energy transfer; thus higher voltages typically lead to larger power and / or energy densities. Lithium ion batteries are stable, charge somewhat rapidly (in hours), exhibit low self-discharge, and require very little maintenance. Except as explained below, the safety, cycle life (about 300 to 400 cycles), calendar life (about 3 years), environmental impact and power of lithium ion batteries is comparable to those of NiMH and NiCd batteries.

Conventional, graphite-based, lithium ion batteries are the batteries of choice in small electronics, such as cell phones and portable computers, where high energy and light weight are important. These same attributes are desired for electric vehicle, hybrid electric vehicle, power tool and uninterruptible power supply markets. However, these applications are principally high power demand applications and/or pose other demands on usage, such as extremes of temperature, need for short recharge times, high proportional (to stored energy) current rates and even longer extended lifetimes. Because of safety concerns related principally to the presence of graphite, conventional graphite-based lithium ion batteries sufficiently large for such power uses are considered unsafe. In addition, current lithium ion technology is capable of about 300 to 400 cycles and has a life of about 3 years, whereas the vehicles in which they are used have lifetimes as long as 10 to 15 years and require many hundreds, even thousands, of charge/discharge cycles. Conventional lithium ion batteries also do not function well at extremely hot or cold temperatures.

The Performance Materials Division

We have named the portion of the nanomaterials and titanium dioxide pigment technology that was developed to produce high quality titanium dioxide pigment the Altair Hydrochloride Pigment process, or AHP. This package of technologies includes four US patents, trade secrets and know-how developed over nine years of research and development. The technology represents a comprehensive process to extract heavy minerals such as titanium from raw materials, produce a high quality titanium dioxide pigment and minimize environmental impact.

We believe that AHP is the first new, comprehensive technology to produce titanium dioxide pigment in over fifty years and takes advantage of new technologies to enable high quality pigment production. Titanium dioxide pigment is produced in bulk and is used principally as a whitener and opacifier for paper, plastics and paint. AHP uses a dense-phase crystal growth technique that controls crystal formation using a combination of mechanical, fluid dynamics, chemical and thermal control. We believe that costs associated with this process will be lower than costs associated with alternative processes. All hydrochloric acid waste streams can be recycled to recover acid, and the waste solids generated from the purification process are easily manageable iron oxides.

In April 2007, we announced the formation of a joint venture company, called AlSher Titania. AlSher Titania represents a joint venture with The Sherwin-Williams Company, one of the world's leading manufacturers of paint and durable coatings. AlSher Titania will combine the Altairnano Hydrochloride Pigment (AHP) process and the Sherwin-Williams Hychlor Pigment (SWHP) process and other technologies to develop and produce high quality titanium dioxide pigment for use in paint and coatings, as well as nano titanium dioxide materials for use in a variety of applications including those related to removing contaminants from air and water.

As part of the formation of AlSher Titania, we granted Alsher Titania an exclusive license to use Altairnano’s technology (including its hydrochloric pigment process) for the production of titanium dioxide pigment and other titanium containing materials (other than battery or nanoelectrode materials). We received no consideration for the license other than our 70% ownership interest in Alsher Titania. Certain potential improvements in the technology are licensed back to us subject to a royalty equal to the greater of 5% of the nets sales price of derivative products or 10% of the gross margin on such products. Absent early termination, the license extends through the expiration of the underlying patents.

Our contribution to the joint venture also included certain pilot plants assets with a book value, net of depreciation, of \$3,110,000. Sherwin agreed to contribute cash to Alsher Titania and a license agreement related to a technology for the manufacture of titanium dioxide using the digestion of ilmenite in hydrochloric acid.

Among the best capitalized in
peer group
Quality of capital is solid
Tier 1 made up of 100% common
equity as of 10/1/10
Fully redeemed preferred stock
issued to U.S. Treasury in 1Q10
Redeemed $500MM of 6.57%
Trust Preferreds (TruPS) on
10/01/10
Doubled quarterly common stock
dividend to $0.10 per share
Authorized share and warrant
repurchases
Strong capital supports future
growth
Source: SNL Financial
Peer Group: BBT, FITB, HBAN, KEY, MI, MTB, PNC, RF, STI, USB, ZION (4Q10 averages exclude MI and MTB)
1
See Supplemental Financial Data slides for reconcilements of non-GAAP financial measures

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Sterling Bank Acquisition

A Unique Opportunity

Accelerates Comerica s growth strategy in Texas

Significantly boosts Texas presence with solid deposit base and well located branch network

Houston deposit market share triples

Entry into San Antonio market

Complements Dallas-Fort Worth locations
Enhances growth opportunities with focus on Middle Market and Small Business
Leverages additional marketing capacity to offer a wide array of products and services through a larger distribution channel
Timely: economic, regulatory and market environment
Maintains strong pro forma capital position
Expect seamless integration: Manageable size within footprint

18
C&D $2.3B
6%
Residential
Mortgage &
Consumer
$3.9B 10%

C&I $24.3B
60%
CRE-Owner
Occupied
$7.8B 19%
CRE $1.9B
5%
Sterling Bank Acquisition
Opportunity to Leverage C&I Expertise
As of December 31, 2010; $Billions
CRE: Non-owner occupied Commercial Real Estate; C&I: Commercial and Industrial includes Lease Financing and International Loans; C&D: Construction and Development
Residential
Mortgage &
Consumer
$0.4B 15%
C&I $0.6B
23%
C&D $0.2B 8%
CRE- Owner
Occupied
$0.6B 22%
CRE $1.0B
32%
Sterling Bank
$2.8B Loans
Comerica Bank
$40.2B Loans
Comerica Bank
Texas Market
$6.8B Loans
C&D $1.0B
14%
Residential
Mortgage &
Consumer
$0.4B 7%
C&I $4.3B
63%
CRE-Owner
Occupied
$0.8B 12%
CRE $0.3B 4%

19
Sterling Bank Acquisition
Attractive Deposit Mix
Time
$0.7B 17%
Non-
interest

bearing
$1.3B 31%
Money
Market,
NOW &
Savings
$2.2B 50%
Brokered
CD
$0.1B 2%
Sterling Bank
$4.3B Deposits
As of 12/31/2010; $Billions
Money
Market,
NOW &
Savings
$2.3B 40%
Time $1.2B
22%
Non-
interest
bearing
$2.2B 38%
Money
Market,
NOW
&Savings
$19.0B 47%
Time $5.9B
15%
Non-interest
bearing
$15.6B 38%
Comerica Bank
$40.5B Deposits
Comerica Bank
Texas Market
$5.7B Deposits
4Q10 Interest-bearing deposit costs:
40 basis points
54 basis points
76 basis points

20
Sterling Bank Acquisition
Expanding in Attractive Markets
Houston
San Antonio
Austin
Fort Worth

Dallas
Sterling Bank Branch
Comerica Banking Center
Source: SNL Financial as of 06/30/2010
Rank and share % data not provided for San Antonio Market as it includes branches in Kerrville. San Antonio and Kerrville are not listed in SNL Financial as a combined MSA
2
2
Deposits
Branches
$mm
Rank
Share %
Texas Market
CMA
94
5,230
10
1.18
SBIB
60
4,142
13
0.94
Pro forma
154
9,372
6
2.12
Houston MSA
CMA
34
1,389
12
1.15
SBIB
33
3,269
6
2.70
Pro forma
67
4,658
6
3.85
Dallas -
Fort Worth MSA
CMA
49
3,460

5
2.31
SBIB
13
266
45
0.18
Pro forma
62
3,726
5
2.49
Entry into San Antonio Market
CMA
0
0
SBIB
14
607
Pro forma
14
607
Austin MSA
CMA
11
381
11
1.66

21
Sterling Acquisition
Fits Comerica s Main Street Bank Strategy
Accelerates growth in Texas urban markets

Nearly doubles branch presence in Houston

Entry into San Antonio market

#6 largest deposit market share in state
Financially attractive

Expect to be break even in first full year
and increasingly accretive
thereafter

Conservative assumptions (synergies and credit marks)

Price/Tangible Book Value of about 2.3x and deposit premium of about
17% --
fair value consistent with recent Texas healthy bank transactions
Expect seamless integration

Size: Manageable

Location: Within footprint

Culture: Business banking
Maintains strong capital position

Pro forma 12/31/10 Tier 1 Capital Ratio 10.0%
1
Pro forma as of 06/30/2010 based on SNL Financial data
2
First full-year assumed to be fiscal year 2012; Break even analysis excludes merger and integration costs
1
2

22

Consistent strategy

Based on relationship banking model

Core businesses and geographies unchanged

Recession-tested business model
Expense management
Solid capital position
Investing to accelerate growth and balance

Banking center expansion in high growth markets

New and enhanced products and services

Expansion in Texas with pending Sterling Bancshares acquisition
Poised for the Future
Main Street Bank
Well Positioned for Growth

23
The
Tier
1
common
capital
ratio

removes preferred stock and qualifying trust preferred securities from Tier 1 capital as defined by and calculated in conformity with bank regulations. The tangible common equity ratio removes preferred stock and the effect of intangible assets from capital and the effect of intangible assets from total assets.

The Corporation believes these measurements are meaningful measures of capital adequacy used by investors, regulators, management and others to evaluate the adequacy of common equity and to compare against other companies in the industry.

[1] Regulatory Capital, Tier 1 Capital and risk-weighted assets as defined and calculated in accordance with regulation.

	12/31/10	9/30/10	6/30/10	3/31/10	12/31/09
Total Regulatory Capital	$8,651	$8,566	$9,001	$9,062	$10,468

Tier 1 capital
Less: Fixed rate cumulative perpetual preferred stock
Less: Trust preferred securities
$6,027
--
--
$5,940
--
--
$6,371
--
495
$6,311
--
495
$7,704
2,151
495
Tier 1 common capital
Risk-weighted assets
Tier 1 common capital ratio
6,027
59,506
10.13%
5,940
59,608
9.96%
5,876
59,877
9.81%
5,816
60,792
9.57%
5,058
61,815
8.18%
Total shareholders
equity
Less: Fixed rate cumulative perpetual preferred stock
Less: Goodwill
Less: Other intangible assets
$5,793
--
150
6
$5,857
--
150
6
$5,792

--
150
6
$5,668
--
150
7
$7,029
2,151
150
8
Tangible common equity
$5,637
$5,701
$5,636
$5,511
$4,720
Total assets
Less: Goodwill
Less: Other intangible assets
$53,667
150
6
$55,004
150
6
$55,885
150
6
$57,106
150
7
$59,249
150
8
Tangible assets
$53,511
$54,848
$55,729
$56,949
$59,091
Tangible common equity ratio
10.54%
10.39%
10.11%
9.68%
7.99%
1
1
Supplemental Financial Data

Reconciliation of non-GAAP financial measures with financial measures defined by GAAP ($ in millions)

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Additional Information For Shareholders

In connection with the proposed merger transaction, Comerica has filed with the SEC a Registration Statement on Form S-4 that includes a preliminary Proxy Statement of Sterling, and a preliminary Prospectus of Comerica, as well as other relevant documents concerning the proposed transaction. SHAREHOLDERS ARE URGED TO READ THE REGISTRATION STATEMENT AND THE PRELIMINARY PROXY STATEMENT/PROSPECTUS REGARDING THE MERGER, THE DEFINITIVE PROXY STATEMENT/PROSPECTUS WHEN IT BECOMES AVAILABLE AND ANY

OTHER RELEVANT DOCUMENTS FILED WITH THE SEC, AS WELL AS ANY AMENDMENTS OR SUPPLEMENTS TO THOSE DOCUMENTS, BECAUSE THEY WILL CONTAIN IMPORTANT INFORMATION. A free copy of the preliminary Proxy Statement/Prospectus, and, when it becomes available, a free copy of the definitive Proxy Statement/Prospectus, as well as other filings containing information about Comerica and Sterling, may be obtained at the SEC s Internet site (http://www.sec.gov). You will also be able to obtain these documents, free of charge, from Comerica at www.comerica.com under the tab Investor Relations and then under the heading SEC Filings or from Sterling by accessing Sterling s website at www.banksterling.com under the tab Investor Relations and then under the heading SEC Filings.

Comerica and Sterling and certain of their directors and executive officers may be deemed to be participants in the solicitation of proxies from the shareholders of Sterling in connection with the proposed merger. Information about the directors and executive officers of Comerica is set forth in the proxy statement for Comerica s 2010 annual meeting of shareholders, as filed with the SEC on a Schedule 14A on March 19, 2010 and on a Form 8-K filed with the SEC on January 27, 2011. Information about the directors and executive officers of Sterling is set forth in the proxy statement for Sterling s 2010 annual meeting of shareholders, as filed with the SEC on a Schedule 14A on March 5, 2010 and on Forms 8-K filed with the SEC on June 25, 2010, July 12, 2010 and January 21, 2011. Additional information regarding the interests of those participants and other persons who may be deemed participants in the transaction may be obtained by reading the above-referenced preliminary Proxy Statement/Prospectus and the definitive Proxy Statement/Prospectus regarding the proposed merger when it becomes available. Free copies of these documents may be obtained as described in the preceding paragraph.