ALTAIR NANOTECHNOLOGIES INC
Form 10-K
April 02, 2013

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, 2012

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

1-12497
(Commission File No.)

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

Delaware	33-1084375
(State or other jurisdiction of incorporation)	(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 Stock, par value $.001 per share	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 whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). 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, a non-accelerated filer or a smaller reporting company. See definition of "accelerated filer", "large accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act (Check one):

[ ] Large Accelerated Filer [ ] Accelerated Filer

[ ] Non-accelerated Filer [X] Smaller reporting Company

(Do not check if a smaller reporting company)

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 shares of common stock held by non-affiliates of the Registrant on June 30, 2012, based upon the closing stock price of the shares of common stock on the NASDAQ Capital Market of $3.12 per share on June 30, 2012, was approximately $14.2 million. Shares of common stock 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 29, 2013, the Registrant had 11,590,067 shares of common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Proxy Statement on Schedule 14A for the Registrant's 2012 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, 2012 (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 shares of common stock 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.

Unless the context requires otherwise, all references to "Altair," "we," "Altair Nanotechnologies Inc," or the "Company" in 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. Altairnano, Inc. directly wholly owns Altair Nanotechnologies (China) Co., Ltd., a Wholly Foreign Owned Enterprise ("WOFE") in China ("Altair China") and Altair China directly wholly owns Northern Altair Nanotechnologies Co., Ltd., a domestic company in China ("Northern Altair").

We have registered the following trademarks: Altair Nanotechnologies Inc® and Altairnano®. Any other trademarks and service marks used in this Report are the property of their respective holders.

Item 1: Business.

We are a Delaware company that develops, manufactures and sells nano lithium titanate batteries and energy storage systems. Our nano lithium titanate battery systems offer higher power density, longer cycle life, rapid charge and discharge capabilities, a wider operating temperature range and higher levels of safety than conventional lithium-ion batteries. We target applications that effectively utilize the key attributes of our technology, and these applications can be found primarily in the electric grid, transportation (commercial vehicles), and industrial market segments.

In our largest target market, the electric grid, we design, manufacture and sell grid-scale battery systems, which can provide ancillary services including frequency regulation. We were one of the earliest entrants into this market; we commissioned the first grid-connected lithium battery that delivered commercial frequency regulation services for the grid in 2008. This system, which was built with AES, was validated by KEMA, a leading electric grid research firm, who noted the merits of our system and its fast response capabilities. Since that time, we have also worked with the Hawaii Natural Energy Institute, Vestas and TSK Solar to develop advanced energy storage systems, which are not only capable of providing frequency regulation services, but can also integrate renewable energy, such as wind and solar, onto the grid.

In our next target market, we have focused on the medium- to heavy-duty electric vehicle market. We are currently working with multiple vehicle manufacturers and suppliers regarding their hybrid and electric vehicle efforts. For example, pursuant to our April 2012 economic development with the City of Wu'an in Hebei Province in China, we shall supply the city with up to 200 electric buses over a multi-year period. In August 2012, we received a $1.9 million down payment on a $6.3 million order for the first 50 electric buses that Wu'an will buy under its multi-year, 200 unit order. In addition, we are working with Proterra, which is a leading electric bus company, who uses our nano lithium titanate batteries to create a system which can rapid charge in 10 minutes through an inductive (wireless) charging system. Pursuant to our May 2012 supply agreement with Proterra, we will be supplying our nano lithium

titanate battery modules to Proterra throughout 2013.

In our third target market, which is industrial, we have entered into various test programs with major industrial companies to develop and/or supply batteries and battery systems for use in different industrial applications. In 2012, we sold application kits, modules and our PowerRack system into this market. We are currently in discussions with a number of companies who are currently testing our products for a diverse range of industrial applications.

We utilize our proprietary process to manufacture nano lithium titanate materials. These materials are used to create a battery anode, which in turn, is utilized in our large format prismatic cell design. Unlike many of our competitors, we do not manufacture our own cells, and have chosen instead to leave this capital-intensive task to a few key suppliers, who are currently based in Asia.

In order to further reduce the cost of our battery products, we intend to aggregate aspects of our supply chain in Asia, where many of our current battery cell and battery component suppliers are based. Toward this end, we launched a plan in 2012 to transfer the production of our nano lithium titanate materials to China, so that we could aggregate the production of our nano lithium titanate materials and cells. We will no longer have to ship nano lithium titante materials from Reno, Nevada to our Asian cell suppliers, and then ship cells back to Anderson, Indiana. Under the new plan, we can simply produce our nano lithium titanate materials at our planned manufacturing facility in China, source battery components and materials, and then build cells through our suppliers in Asia. These cells can then be shipped to our planned energy storage system assembly plant in China or to our existing production facility in Anderson, Indiana. We believe that we will be able to reduce the cost of our batteries and shorten our lead times through this strategy.

In 2012, we focused on the launch of our newest energy storage system, the ALTI-ESS Advantage; the delivery of our customer systems; the sale of our products; and the launch of our new China operations.

First, we focused our product development on the launch of our newest electric grid product, the 2 megawatt ALTI-ESS Advantage, which increased our system specification from 1 megawatt to 2 megawatts, while reducing the containerized power module’s footprint from 53 feet to 40 feet.

Second, we focused on the manufacture of five grid-scale energy storage systems for four customers, who included the Hawaii Natural Energy Institute (HNEI), Vestas, TSK Solar and a U.S. utility company based on the East Coast. We completed the build of all five systems and delivered three of these systems to our customers during the year. Four of these systems will be used for the integration of renewables in addition to providing frequency regulation services.

Third, we focused on the sale of our products into our three core market segments. We sold our first ALTI-ESS Advantage to TSK Solar in October 2012. This system will be used at TSK Solar’s 26 megawatt San Fermin solar project in Puerto Rico. And, in January 2013, we sold an ALTI-ESS Advantage to the Hawaii Natural Energy Institute, which is the third system that they have purchased from us. We entered into a new supply agreement in May 2012 with Proterra, which is a leading electric transit bus company and initiated a test and validation program with Proterra in 2012 in preparation for our 2013 deliveries to them.

In 2012, we also focused on the launch of our operations in China. We expect that over time a meaningful portion of our sales, and eventually key portions of our manufacturing, will originate from China. We believe that we can reduce our costs and improve our lead times by moving our nano lithium titanate materials production closer to our contract cell manufacturers who are already located in Asia. For this purpose, we formed Altair China, a Wholly Foreign Owned Enterprise ("WFOE") in China, which in turn formed a wholly owned subsidiary, Northern Altair that would serve as our prospective manufacturing entity. We pursued an economic development deal in China, and in April 2012, we entered into an agreement with the cities of Wu'an and Handan, which are both located in Hebei Province in China. Under this economic development agreement, Altairnano would receive a package of incentives, which included the transfer of certain land use rights and orders for product, such as electric buses. To date, we have received the following orders and benefits in China:

- In October 2012, Northern Altair entered into a Contract on Assignment of State-owned Construction Land Use Right (the "Land-Use Agreement") , pursuant to which Northern Altair acquired the right to use the 66 acres of commercial land north of Dongzhuchang Village in Wu'an, China for a period of 50 years subject to certain terms and conditions. As consideration for the land use right, Northern Altair paid a land use fee of approximately $11.9 million and land transfer taxes and fees of approximately $1.7 million and agreed to make fixed asset investments on the land of approximately $167 million, subject to loan guarantees and other incentives from Wu'an, China, over an unspecified period of time up to the 50 year life of the land use right, with initial construction being required to begin by March 31, 2013. In January 2013, initial construction on a manufacturing facility began on the Company's land use right in China. The costs incurred to date by the Company are not material. The Company estimates the initial phase of this project will cost approximately $3 million and will be completed in 2013. The Company has not yet obtained loan guarantees for these costs. Additional construction phases will be contingent upon loan guarantees and other incentives from Wu'an, China as well as other market conditions. The definition of total fixed asset investments includes the cost of buildings, structures, auxiliary facilities, and equipment, as well as the land-use fee. Northern Altair may transfer and sublease portions of the granted land once it has invested 25% of the total fixed asset investments amount and completed 25% of the project. Closing occurred on November 9, 2012. We intend to establish our nano-lithium titanate and energy storage system manufacturing facilities on this land in 2013, and have completed the design of our planned production facilities. We anticipate that the majority of systems built in the Northern Altair energy storage system facility will be for the Asian market, while our Anderson facility will continue to build modules and systems for our U.S. customers.

- In November 2012, Northern Altair received cash grant incentives of $11.8 million from the Wu'an government, which shall be used to support the construction of our planned facilities in Wu'an and the purchase of manufacturing equipment. Northern Altair is investigating and applying for additional incentives and grants to help support our planned production activities.

In 2012, we successfully pursued many initiatives, executed on key customer deliverables, and positioned ourselves for expansion into new markets, such as China.

Primary Products and Markets

Primary Products

We have developed, and continue to develop, through our primary materials science research, a lithium-ion battery chemistry using nanotechnologies to create materials offering unique electrochemistry properties for rechargeable batteries. We refer to this material as nano lithium titanate, and it is applied to the battery anode. Our nano lithium titanate battery cells offer 4 to 10 times greater life than conventional lithium-ion technologies, an ability to rapidly discharge and charge, an ability to operate in extremely cold and hot temperatures, and a greater margin of safety than other lithium-ion technologies. Our nano lithium titanate batteries are designed to focus on high power applications,

and are ideally suited for fast response applications in the electric grid segment for grid stability, hybrid and all-electric vehicles, and industrial applications.

We manufacture a range of cells, modules, packs and turn-key energy storage systems for our target customers, including 24V, 36V, and 48V industrial and transportation systems, a configurable industrial PowerRack system, and large-scale systems for the electric grid.

Target Markets

Electric Grid

Globally, electric utilities and power generation companies seek to maintain high levels of grid stability while seeking cost effective ways to accurately match electricity generation with demand. Essentially, there is no inventory of electricity; demand and generation must match. While the industry is capable of doing this from hour to hour, variations in load and demand from minute to minute cannot be accurately forecasted. When imbalances occur, the frequency (60 Hz in the U.S) can vary and must be balanced within very tight tolerances. Maintaining these tolerances is typically achieved through the use of auxiliary generators. If the load is either higher or lower than the power being generated, an auxiliary generator is either started or stopped. However, it takes these generators from generally five to 15 minutes to ramp up to full efficient operation or to shut down. During that period, the load may change directions and the grid operator then must direct another auxiliary generator to shut down or ramp up. This is a very inefficient process with the grid operators constantly chasing a variable load. The process of managing these very short-term changes in energy demand is referred to as “frequency regulation.” The chart below depicts what a typical workday in the PJM Regional Transmission Organization that manages the electric grid in the Mid-Atlantic states region looks like and how our battery can help smooth out the fluctuations.

Electricity demand on a typical workday in the PJM electric grid covering the Mid-Atlantic states and District of Columbia

Utilities can address frequency regulation issues by maintaining on-line generating capacity at a level that is always higher than expected peak demand; however this can be an expensive solution, particularly where natural gas, diesel and other alternative fuels are not affordable alternatives. Most U.S. utilities are required to maintain between 1% - 1.5% of their peak load capacity to provide frequency regulation. As an example, for the PJM Regional Transmission Organization, this requirement translates into a 900 megawatt daily requirement. In many foreign countries where the electric grid is not as well developed as it is in the U.S., utilities need to reserve up to 5% or more of their capacity strictly to provide frequency regulation.

According to a 2013 report from Pike Research, annual worldwide installations of energy storage for ancillary services will increase more than ten-fold over the next ten years, growing from less than 330 megawatts in 2013 to more than 3,500 megawatts in 2023. While this estimate represents a “ballpark” figure and has a highly variable dollar range, especially as the cost of technology drops over time, the potential size of the market remains significant. To reduce the costs of providing frequency regulation, utilities and grid operators are seeking “fast response” energy storage systems, and battery-based systems can offer significant advantages over slower response sources of conventional generation. When supply exceeds demand for a short period, fast response storage systems deliver electric energy back to the grid for a short period to give operators time to reroute energy from another power generator or power-up a new power source. Our large-scale nano lithium titanate battery systems can react in milliseconds and meet this need.

The need for a fast response energy storage technology, like our large-scale nano lithium titanate battery, is increased by the accelerated use of renewable energy sources. Photo Voltaic (PV) solar and wind power generation by nature are intermittent and unpredictable sources of energy that can fluctuate widely in a very short period of time. For example, it is not uncommon for a PV array to fluctuate +/- 50% in less than 90 seconds. With a small rooftop array, it isn't an issue, because the size of the generator is too small to matter. However, with a 50+ megawatt array, problems arise as the electric grid isn't currently built to handle this kind of a fluctuation. According to the Federal Energy Regulatory Commission, as of December 2012, twenty nine states and the District of Columbia require the integration of renewable energy sources into the power grid through legislated renewable portfolio standards as shown in the following table.

Final Target	Number	States with Renewable Mandates (RPS)
10% - 14%	7	Iowa, Maine, Mich., N.C., Ohio, Texas, Wis.
15% - 19%	6	Ariz., Mo., Mont., Pa., R.I., Wash.
20%	3	Kansas, Md., N.M.
21% - 24%	3	N.H., N.J., Mass.
25% - 29%	7	Conn., Del., Ill., Minn., Nev., Ore., WV
30% - 39%	3	Calif., Colo., N.Y.
40% +	1	Hawaii

Many of these states have established targets requiring the integration of renewable generation sources equal to or exceeding 25% of total generation within the next decade. California is a good case in point. California has a mandate to generate 33% of its electricity from renewable energy sources by 2020. The mandated adoption of these renewable energy sources is likely to increase the need for effective, efficient, clean energy storage technologies to provide frequency regulation services and maintain the reliability and stability of the associated electric grid systems. For example, California Assembly Bill 2514 enacted in 2010, requires the California Public Utilities Commission (CPUC) to establish energy storage procurement targets for California load serving entities in 2015 and 2020, if cost effective and commercially viable by October 2013. Implementation of AB 2514 is underway, and in February, 2013, CPUC approved a long term procurement decision and ordered Southern California Edison (SCE) to procure between 1,400 and 1,800 megawatts of energy resource capacity in the Los Angeles basin to meet long term local capacity requirements by 2021. Of this amount, CPUC required SCE to procure at least 50 megawatts from energy storage resources, as well as up to an additional 600 megawatts of capacity from preferred resources, which include energy efficiency, demand response and distributed generation, along with additional energy storage resources.

In our view, the key to addressing this market is to continually improve the performance of our energy storage systems, while reducing their cost (or the perception of their higher cost) to the end user. One key advantage that Altairnano's battery systems have is their projected higher cycle life, which can be four to six times higher than that of competing lithium battery technologies, such as lithium iron phosphate. Accordingly, we seek to market our products not on an initial cost of acquisition basis or even on a watt-hours per kilogram basis, but rather on the total cost of ownership over time. In addition, we seek to market the fast response capabilities of our battery, the value of which cannot be captured on a simple watt-hours per kilogram basis. The importance of fast response resources is beginning to gain considerable traction, as evidenced by the Federal Energy Regulatory Commission's (FERC) Order 755, whose "pay for performance" rules not only value the capacity of frequency regulation services, but also its speed and accuracy. We believe that these pay for performance rules will help mitigate the impact that low natural gas prices have had on the U.S. energy storage market for the electric grid.

Transportation (Commercial Vehicles)

Large cities, counties and transit authorities are increasingly turning to electric and hybrid electric buses to reduce pollution and reliance on diesel fuel for their transportation systems, especially in markets like China where there are

significant levels of pollution. Commercial vehicle manufacturers, including medium-duty and heavy-duty trucks, are likewise evaluating hybrid systems to improve fuel economy and in some instances run battery-only systems at low speeds. At this stage of the market development, electric and hybrid electric vehicles generally cost more than their conventional counterparts, although the upfront cost may be offset by lower operating costs and a potentially longer operating life. Proterra had one of its all-electric buses using our batteries tested at the Altoona Test Track by Penn State University and demonstrated a 17.5 to 29.5 miles per gallon (mpg) fuel equivalent vs. a normal diesel bus that achieved under 4 mpg. This difference translates into a fuel savings of about $350,000 over the life of the bus assuming a fuel cost of $3.50 per gallon. This is in addition to the savings in maintenance costs over the life of the bus, as a result of fewer mechanical systems and moving parts to maintain. We believe that cities, counties and commercial vehicle operators are willing to accept the higher upfront costs in order to benefit from the expected savings in long-term operating costs and potentially longer operating life, as well as the environmental benefits.

Electric and hybrid-electric commercial vehicles require a significant amount of power, operate throughout the day, have a long expected life and run in extreme temperature ranges. The relative strengths of our nano lithium titanate batteries, including the high levels of power, rapid charge and discharge rates, long cycle life and ability to function at temperature extremes, are particularly well suited for electric and hybrid commercial vehicles, giving us what we believe is a compelling competitive advantage in this market.

In a 2012 research report, Pike Research projects that the global market for electric drive buses will grow at a compound annual growth rate of 26 percent from 2012 to 2018. Their report projects that by 2018, there will be more than 75,000 electric buses in service around the world. The Pike Research study projects that the largest sales volumes will come from the Asia Pacific region, which will represent 75 percent of the world total. The study projects that more than 15,000 electric buses will be sold in the Asia Pacific region in 2018, while 2,500 will be sold in North America in the same year. With the growing concern regarding the release of pollutants associated with burning fossil fuels, the attractiveness of all electric and hybrid electric buses is rapidly growing. We are attempting to establish our nano lithium titanate batteries as the power source of choice in this emerging market. Given the projected growth of electric buses in the Asia Pacific region, we view China as one of our largest market opportunities within the transportation segment. We have already received a 200 unit electric bus order from the city of Wu'an, which will initially be fulfilled with 50 electric buses built by third parties. We have also commenced discussions with other potential customers in China that operate in this segment in order to sell our battery modules and/or systems into this segment of the transportation market.

Industrial. The industrial market segment encompasses a broad range of applications, ranging from the use of battery systems on cargo cranes to the use of battery systems with heavy industrial equipment. We believe that our high power batteries can play an important role within this market segment, and have commenced a number of programs with prospective customers to test the use of our nano lithium titanate batteries within a diverse range of industrial applications.

Military Uses. As a condition to closing our funding transaction with Canon in 2011, we ceased all operations in the military market effective as of December 31, 2010. However, in 2012, Altairnano initiated work to reengage with the U.S. military, and we will continue our efforts in 2013 to potentially re-enter this market segment.

Key Features of Our Nano Lithium Titanate Batteries

One of the principal advantages of our nano lithium titanate battery is its rapid charge and discharge rate. The charge rate is the rate at which a battery's energy is replenished, and the discharge rate is the rate at which the energy stored in a battery is transferred (or, in the case of self-discharge, leaked) out. Through the optimization of materials used in our nano lithium titanate battery cells, our current cells are capable of recharge times of 10 minutes to 95% or more of initial battery capacity. This rapid charge capability is important in our target markets.

Our nano lithium titanate batteries have both a longer cycle life and calendar life than commercially available rechargeable battery technologies such as conventional lithium ion, nickel-metal hydride (NiMH) batteries and nickel cadmium (NiCd) batteries. The ability of any rechargeable battery to store energy will diminish as a result of repeated 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 energy storage capacity. Our nano lithium titanate is termed a zero strain material, meaning that the material essentially does not change shape upon the entry and exit of a lithium ion in the material. Graphite, the most common material in conventional lithium ion batteries, will expand and contract as much as 8% with each charge/discharge cycle. This constant change in volume rapidly breaks down the battery resulting in significantly shorter calendar and cycle life than with our nano lithium titanate anodes. Our current generation of cells can achieve 16,000 cycles, which represents a significant improvement over conventional lithium batteries, which typically retain that level of charge capacity only through 2,500 to 4,000 deep charge/discharge cycles. Depending on the actual duty cycles and temperature, those figures can drop even lower.

Our nano lithium titanate also represents a breakthrough in low and high-temperature performance. Nearly 90% of room temperature charge retention is realized at -30°C from our nano lithium titanate battery cells. In contrast, common lithium ion technology possesses virtually no charging capabilities at this low temperature, and the other rechargeable battery types such as lead acid, NiMH and NiCd take 10 to 20 times longer to charge at this low temperature.

We also believe that relative safety is one of the strengths of our nano lithium titanate batteries. Any battery cell or large battery unit with lithium ion cell technology must take into account safety considerations, the most important of which is thermal runaway. Thermal runaway is the temperature at which the battery chemistry will break down causing the battery to overheat and potentially explode or catch fire. This temperature is often referred to as the critical temperature. Critical temperature for lithium ion battery cells using conventional graphite anodes is around 130° C, a direct result of chemical reaction between the graphite and the electrolyte. With our current nano lithium titanate anode in place of graphite and an appropriate cathode material, that critical temperature will be close to 200° C, an increase in safety margin of approximately 70° C. Materials we are using in our lab operate at 250oC before the critical temperature is reached. The batteries we and our partners are developing for high power applications often consist of dozens or even thousands of battery cells working together as part of a single modular battery unit. When a large number of cells are aggregated into a single battery unit, the likelihood of, and risks associated with, thermal runaway increases. In this context, we believe that the additional temperature margin our individual battery cells experience before reaching the critical temperature makes our battery cells better suited than competing lithium ion batteries for the high-power applications we are targeting.

The current generation of batteries made with our nano lithium titanate exhibit lower energy density at room temperatures than conventional lithium ion systems. Moreover, we are developing newer generations of nano lithium titanate batteries, which will increase our energy density, while maintaining the unique power and cycle life capabilities of our batteries. Energy density is normally described as watt-hours per kilogram or watt-hours per liter and refers to the available energy per unit weight or per unit volume. A battery with high energy density will deliver more energy per unit weight or volume than a battery with lower energy density. Our batteries made with our nano lithium titanate have energy densities, watt-hours per kilogram, that are better than lead acid, NiCd and NiMH batteries and approximately 50-70% of conventional lithium ion batteries when operated at room temperature. However, this energy density disadvantage is significantly less compared to conventional lithium ion batteries as the operating temperature moves away from room temperature, particularly to colder environments, and less significant in environments such as large vehicles and utilities in which battery volume is not a significant issue. When the end use of the battery requires constant performance across a wide range of temperatures, such as the need for a hybrid bus to function comparably in both winter and summer, our nano lithium titanate cells may be the preferred solution. Also, conventional lithium ion batteries prefer to cycle between approximately 30% and 80% state of charge to achieve optimum cycle life. As a result, they only use about 50% of their nominal available energy. Our nano lithium titanate

batteries, on the other hand, are not so limited and as a result can use approximately 90% of their nominal available energy. Given this, we believe that comparisons of battery technologies on a watt-hours per kilogram basis can be misleading, as nano lithium titanate batteries offer a greater range of actual usable energy, along with four-to-six times the cycle life across a wider range of operating conditions.

Sources of Supply and Raw Materials

An important consideration, as we begin to grow our revenue stream, is to ensure that we have access to the various components and raw materials we need to manufacture and assemble our various products. As we anticipate larger orders, establishing multiple sources for key components is becoming much more important to us. Moreover, a key focus of our new business plan is to aggregate our supply chain not only to reduce cost, but also to accelerate our ability to deliver products on a timely basis to our customers.

The basic building block for our battery cell's anode is nano lithium titanate powder. We use compounds of lithium and of titanium to manufacture our nano lithium titanate. We currently source our lithium compound from two of the largest producers in the world and do not foresee any problems in scaling up our purchases as our volume of business increases, or as we move production of our nano lithium titanate to China. We are also working to qualify additional sources of lithium supply. We currently source our titanium compound from a single provider who is a global leader in the field, and we are in the process of identifying and qualifying additional sources for this key material. At this point we are not anticipating any problems or disruptions to our supply of these raw material compounds.

As of the date hereof, we have multiple sources for the contract manufacturing of our nano lithium titanate battery cells, which are the building blocks of our battery modules and energy storage systems. Rather than incur the high cost of building our cell manufacturing capabilities, we have chosen to outsource the production of our cells to manufacturers, who can meet our rigorous technical requirements. Most of these cell manufacturers tend to be based in Asia, where there exists considerable production capacity. Accordingly, we have historically focused our cell manufacturing efforts in Asia, and a key part of our current supply chain strategy is to move our nano lithium titanate materials production closer to our existing cell manufacturing supply chain in order to reduce our lead times and costs.

All of the other components and materials used in the manufacture of our nano lithium titanate battery products are readily available from multiple suppliers.

Key Business Developments in Power and Energy

Frequency Regulation. As part of a multi-year development program with AES Energy Storage, LLC ("AES"), a subsidiary of global power leader The AES Corporation, we delivered a 2 megawatt battery system, consisting of two 53-foot container-sized 1 megawatt power modules, to AES in late 2007. AES successfully completed testing of this 2 megawatt battery system in May 2008. The test consisted of AES connecting the battery to the electrical grid at a substation in Indiana and then performing a number of stringent tests to determine if it was capable of providing the services required. These tests were designed and overseen by KEMA, Inc., an independent outside engineering company, and demonstrated that the battery performed well in every respect, meeting or exceeding all expectations. Since then, one of the 1 megawatt units has been put into commercial operation in Pennsylvania and has consistently performed according to specification. The second 1 megawatt unit was moved to a location in Texas to provide the same kind of service in that location.

Since that time, we have been refining our energy storage solution for the electrical power industry and in 2012 launched the newest generation of our ALTI-ESS product. The new ALTI-ESS Advantage increased the technical specification of an individual power module from 1 megawatts to 2 megawatts, while reducing the footprint of the containerized power module from 53 feet to 40 feet. We sold the first of these new systems to TSK Solar in October, 2012, and delivered this system for use in their 26 megawatt solar farm in Puerto Rico in November 2012. We also sold an ALTI-ESS Advantage to the Hawaii in January 2013, which is the third energy storage system that they have purchased from us.

In 2012, we continued to work with Inversiones Energéticas, S.A. de C.V. (INE), one of El Salvador's largest electric utilities, to secure the notice to proceed on a turn-key 10 megawatt ALTI-ESS advanced battery system for frequency control at its Talnique Power Station. We entered into a contract with INE in February 2011, but this project has been delayed due to the regulatory approval process that has been required to enable energy storage on the El Salvador electric grid. We have extended our contract with INE on multiple occasions and continue to work with INE and the regulatory bodies in El Salvador to secure the required approvals.

On an operational front, 2012 represents a solid year for the Company. We built five ALTI-Advantage systems during the year for our customers, which is a Company first. The system builds included two systems for the Hawaii Natural Energy Institute, one system for Vestas, one system for an East Coast utility company, and the above-mentioned system for TSK Solar.

Because of the significant cost and customization involved in the purchase and sale of a multi-megawatt battery storage system, lead times are long in this industry. However, we continue to enter into negotiations with a number of potential purchasers, and have expanded the scope of our sales efforts to include the China market.

As of December 31, 2012, we have a pending installation of the second ALTI-ESS system that they purchased from us. In addition, we sold a third system, our new 2 megawatt ALTI-ESS Advantage, to the Hawaii Natural Energy Institutein January 2013. We are also finalizing the commissioning installation of a system for an East Coast utility customer and expect to commission that system in the first half of 2013.

Hybrid Electric and All Electric Commercial Vehicles and Buses. We have been supplying Proterra, a leading manufacturer of electric buses with battery modules since 2009. In June of 2010, we formalized this relationship with the signing of a long-term supply agreement to provide our advanced lithium-ion battery modules for incorporation into Proterra's all-electric and hybrid-electric buses. In May 2012, we entered into a new supply agreement with Proterra to supply our modules to Proterra throughout 2013.

Expansion Into China. A key part of Altairnano's 2012 business plan was to enter into the China market. First, we sought to develop a manufacturing presence in China to help us our aggregate our largely Asia-based supply chain. In the past, we produced nano lithium titanate materials in Reno, Nevada, shipped those materials to our cell manufacturers in Asia, and then shipped those cells back to Anderson Indiana to produce modules or battery packs. Given the competition in the market and the cost sensitivities of our prospective and existing customers, we did not view this approach as a sustainable way to grow the business and reduce our product costs. We believe that the aggregation of key portions of our supply chain in Asia will help us to reduce our costs and shorten our customer lead times. Second, we view China as a critical market, because there is significant government support for the introduction of renewable energy technologies and applications. Market trends there favor the deployment of alternate fuel vehicles and the integration of wind and solar power. In our view, these trends favor the use of electric and hybrid electric vehicles along with battery-based energy storage, and thus, we view China as a significant part of our business plan again in 2013.

The entry into any new market is challenging, but we focused on our objectives and made solid progress in 2012. We formed Altair China, a WFOE in China, and its wholly-own subsidiary Northern Altair, in China. In April 2012, we entered into an economic development agreement with Wu'an and Handan cities in Hebei Province in China. Under the agreement, we negotiated a package of incentives, which includes orders for EV buses and other battery systems over a multi-year period and the transfer of commercial land use rights in Wu'an in a new industrial and technology park.

In April 2012, we entered into a contract with Wu'an for a multi-year, 200 unit electric bus order. In August, 2012, we received a 30% initial down payment of $1.9 million for the sale of the first 50 electric buses to Wu'an under the April economic development agreement. During the remainder of the year, we focused on the negotiations related to the transfer of the land use rights. In October 2012, Northern Altair entered into the Land-Use Agreement, pursuant to which Northern Altair has acquired the right to use the 66 acres of commercial land north of Dongzhuchang Village in Wu'an, China for a period of 50 years subject to the terms and conditions of the Land-Use Agreement. As consideration for the land use right, Northern Altair paid a land use fee of approximately $11.9 million and land transfer taxes and fees of approximately $1.7 million and agreed to make fixed asset investments on the land of approximately $167 million, subject to loan guarantees and other incentives from Wu'an, China, over an unspecified period of time up to the 50 year life of the land use right, with initial construction being required to begin by March 31, 2013. In January 2013, initial construction on a manufacturing facility began on the Company's land use right in China. The costs incurred to date by the Company are not material. The Company estimates the initial phase of this project will cost approximately $3 million and will be completed in 2013. The Company has not yet obtained loan guarantees for these costs. Additional construction phases will be contingent upon loan guarantees and other incentives from Wu'an, China as well as other market conditions. The total fixed asset investments shall include the cost of buildings, structures, auxiliary facilities, and equipment, as well as the land-use fee. Northern Altair may transfer and sublease portions of the granted land once it has invested 25% of the total fixed asset investments amount and completed 25% of the project. Closing occurred on November 9, 2012. We intend to establish our nano-lithium titanate materials and energy storage system manufacturing facilities on this land in 2013.

After completing the Land-Use Agreement, Northern Altair entered into negotiations regarding a package of incentives to facilitate Northern Altair's establishment of operations and construction efforts. In November 2012, Northern Altair was granted $11.8 million in cash incentives, which shall be used for Northern Altair's construction and manufacturing operations. We also completed the design of our planned nano lithium titanate and energy storage system manufacturing facilities. The actual scope of Northern Altair's construction project and manufacturing operations has been based on the anticipated market demand for the Company's products and on the level of negotiated incentives.

We expect that a meaningful portion of our sales, and elements of our manufacturing, will be conducted by Northern Altair. We began to ramp up our operations immediately following the execution of our economic development deal in April 2012 with Wu'an and Handan, and grew our organization there to 20 employees as of December 31, 2012. It is important to note, however, that Altairnano will also maintain its engineering, R&D, module and energy storage system assembly capabilities in the U.S., not only to service our existing customers, some of whom require U.S. made content, but also to further our R&D and product innovation. We seek to complement and expand the reach of our U.S. operations through our plan in China, rather than to replace or supplant our U.S. operations. However, headcount in the U.S. dropped from approximately 100 employees in early 2012 to 70 employees as of December 31, 2012, as part of a cost reduction plan. Nevertheless, the Company has maintained its core R&D, engineering and operational capabilities.

Proprietary Rights

We have been awarded a total of 12 U.S. and 42 foreign patents. We have a total of 7 U.S. and 37 foreign patent applications pending. The granted patents covering our nano lithium titanate technology include: 1) Method for producing catalyst structures, 2) Method for producing mixed metal oxides and metal oxide compounds, 3) Process for making lithium titanate, 4) Process for making nano-sized and sub-micron-sized lithium-transition metal oxides, and 5) High performance Lithium Titanium spinel Li4Ti5o12 for electrode material. The U.S. patents begin to expire in 2020.

Pending patent applications are directed to a variety of inventions related to aspects of our electrochemical cells including: “Lithium-Ion Batteries and the Methods of Operating the Same”; “Method for Preparing a Lithium-Ion Cell”; and “Method for Preparing a Lithium-Ion Battery.”

Competition

Electric Grid A number of advanced energy storage and power electronic component producers have entered into the frequency regulation market. They include ABB, A123 Systems. (which was acquired by Wanxiang), BYD, GS Yuasa, LG Chem, Mitsubishi, Parker Hannifin, Saft and XtremePower. As we or others continue to demonstrate traction in this market we expect to see increasing levels of competition from other suppliers and systems integrators, especially as the market rules in the U.S. and other markets move towards the acceptance of battery-based energy storage for frequency regulation. Favorable signs emerged in 2012, such as California Independent System Operator’s (CAISO) decision to adopt market changes which would reward frequency regulation resources for fast performance. CAISO now joins PJM Interconnection as the first to propose new rules which seek to comply with FERC’s Order 755, which requires pay for performance, especially for fast response resources that provide frequency regulation services. We believe that these changes are favorable for battery-based energy storage systems in general and for Altairnano’s nano lithum titanate battery technologies specifically, due to our unique fast response capabilities.

Our products typically compete with existing methods for providing frequency regulation and renewables integration rather than competing battery manufacturers. Today, most utilities and regional transmission organizations use existing coal, gas and diesel generating sources to provide frequency regulation. While these sources are inefficient and can be highly polluting (coal and diesel), they are known quantities and accepted by the various regulators and utilities. In many instances, particularly in the U.S., we are attempting to displace this accepted way of doing things. Consequently, the typical sales cycle for selling an energy storage system for frequency regulation can be quite lengthy.

Another challenge is the cost of natural gas in the U.S. Much of the existing frequency regulation in the U.S. is provided by natural gas powered generators, and the price of natural gas pricing has been at historic lows. As a result, there is less of a financial incentive for utilities to implement our solution. This cost environment, however, is not expected to be sustainable. Natural gas prices are volatile and may rise over time, and batteries, like all technologies, will eventually see their prices drop as efficiencies are gained and as production volumes increase. As a result, we see greater opportunities for our frequency regulation products emerging over time in the U.S., especially with the introduction of new market mechanisms that place greater emphasis on fast response services. Moreover, we expect to see growing demand outside of the U.S., where fuel costs are significantly higher. Once this new energy storage capability starts to get market traction, we expect the rate of acceptance to accelerate. Until then, however, we are experiencing a long sales cycle and don't expect that to materially change in the near future. We believe that once we demonstrate revenue traction and demonstrate that the market does exist and is very large, other larger suppliers may also target this market.

Transportation (Commercial Vehicles) In the automotive passenger car markets, there are a large number of battery manufacturers and systems integrators currently serving the market. Many of them are larger companies with substantially stronger financial resources than we have. We believe the passenger car market will be driven by low margins and volume. As a result we believe that only larger, well-capitalized companies will ultimately be successful in this market. We believe that commercial vehicles, including buses, medium- and heavy-duty trucks, on the other hand, present a different set of dynamics. The characteristics of our batteries are an excellent fit to satisfy the requirements of this market, and the needs here are different than in the general passenger car automotive market. We believe that we can be a successful competitor in this segment of the overall transportation market.

With respect to the electric and hybrid electric commercial vehicle markets, we are not aware of any commercially available products that have similar performance attributes as our nano lithium titanate batteries. Nonetheless, competitors have announced advanced lithium ion batteries and battery products aimed at these markets. Some may have greater energy density than our nano lithium titanate batteries. However, we believe that these batteries do not match the cycle life, rapid charge and discharge rates and performance at temperature extremes of our nano lithium titanate batteries.

Currently, NiMH batteries dominate the hybrid electric vehicle market, including the mass-transit market. NiMH batteries improve upon the energy capacity and power capabilities of older alternatives, such as NiCd (for the same size cell) by 30% to 40%. Since they contain fewer toxins than NiCd batteries, NiMH batteries are more environmentally friendly than NiCd batteries, although they are not as environmentally friendly as our nano lithium titanate battery. 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 (i.e. the ability to be discharged to 10% or less of their capacity), possessing a recharge capability following deep discharge on the order of 200 to 300 cycles. While NiMH batteries are capable of high power discharge, dedicated usage in high power applications limits cycle life even further. NiMH batteries also possess high self-discharge rates, which is unintentional leaking of a battery's charge. 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, though, 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, and ultimately fire. A potential limiting factor for the widespread use of NiMH batteries may be the supply of nickel, potentially rendering the technology economically infeasible for these applications as demand continues to rise.

Producers of electric and hybrid electric vehicles are seeking to replace NiMH batteries with lithium ion batteries for several reasons. The demand for these vehicles is placing pressures on the limited supply of nickel, potentially rendering the technology economically infeasible for these applications as the demand continues to rise. Compared to NiMH batteries, conventional lithium ion batteries are stable, charge more rapidly (in hours), exhibit low self-discharge, and require very little maintenance. Except as explained below, the safety, cycle life, calendar life, environmental impact and power of lithium ion batteries is comparable to those of NiMH and NiCd batteries.

Conventional lithium ion batteries are the batteries of choice in small electronics, such as cell phones and portable computers, where high energy density and light weight are important. These same attributes are desired for electric vehicle, hybrid electric vehicle, fast energy storage and other markets. However, these applications are principally high power demand applications and/or pose other demands on usage, such as extremes of temperature, need for extremely short recharge times, and even longer extended lifetimes. Because of safety concerns related principally to the presence of graphite in conventional lithium ion batteries, conventional graphite-based lithium ion batteries sufficiently large for such power uses may raise safety concerns. In addition, current lithium ion technology is only capable of about 2,500 to 4,000 cycles.. Conventional lithium ion batteries also do not function well at extremely hot or cold temperatures. Our batteries - which are safer, have a longer cycle life, rapid charge and discharge rates and function well at extreme temperatures - are designed to address the power market by providing the key benefits of lithium ion batteries without the shortcomings relative to the power market.

Research and Development Expenses

Total research and development expenses were $6.4 million and $7.0 million for the years ended December 31, 2012 and 2011, respectively, while research and development costs funded by customers were $23,000 and $367,000, for the years ended December 31, 2012 and 2011, respectively. Included in the expenses are engineering and development costs not billed to customer projects.

Dependence on Significant Customers

During the year ended December 31, 2012, we received $5.9 million in payments from customers, but recorded only $1.5 million in revenue. Three major customers accounted for 16%, 14% and 13% of our total recognized revenues; they were Alsher Titania LLC, Gen-X and Emrol, respectively. During the year ended December 31, 2011, we recorded revenues from two major customers who accounted for 40% and 34% of total revenues as follows: Proterra Corporation revenues of $2.1 million and YTE revenues of $1.8 million.

Government Regulation

Most of our current and proposed activities are subject to numerous federal, state, and local laws and regulations concerning machine and chemical safety and environmental protection. Such laws include, without limitation, the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, and the Comprehensive Environmental Response Compensation Liability Act. We are also subject to laws governing the packaging and shipment of some of our products, including our nano lithium titanate batteries. Such laws require that we take steps to, among other things, maintain air and water quality standards, protect threatened, endangered and other species of wildlife and vegetation, preserve certain cultural resources, reclaim processing sites and package potentially flammable materials in appropriate ways and pass stringent government mandated testing standards before shipping our battery products.

Compliance with federal, state, or local laws or regulations represents a small part of our present budget. If we fail to comply with any such laws or regulations, however, a government entity may levy a fine on us or require us to take costly measures to ensure compliance. Any such fine or expenditure may adversely affect our development.

Environmental Regulation and Liability

Any proposed processing and manufacturing operations will be subject to federal, state, and local environmental laws. Under such laws, we may be jointly and severally liable with prior property owners for the treatment, cleanup, remediation, and/or removal of substances discovered at any other property used by us; to the extent the substances are deemed by the federal and/or state government to be toxic or hazardous. Courts or government agencies may impose liability for, among other things, the improper release, discharge, storage, use, disposal, or transportation of hazardous substances. We use hazardous substances in our testing and operations and, although we employ reasonable practicable safeguards to prevent any liability under applicable laws relating to hazardous substances, companies engaged in materials production are inherently subject to substantial risk that environmental remediation will be required.

Financial Information about Segments and Foreign Sales

Information with respect to assets, net sales, loss from operations and depreciation and amortization for the Power and Energy Group, and the All Other Division is presented in Note 17, Business Segment Information, of Notes to Consolidated Financial Statements in Part IV.

Information with respect to foreign and domestic sales and related information is also presented in Note 17, Business Segment Information, of Notes to Consolidated Financial Statements in Part IV.

Subsidiaries

Altair US Holdings, Inc. was incorporated by Altair in December 2003 for the purpose of facilitating a corporate restructuring and consolidation of all U.S. subsidiaries under a U.S. holding company. Altair US Holdings owns the capital stock of Mineral Recovery Systems, Inc., which currently has no operations, and Altairnano, Inc.

Altairnano, Inc. (f/k/a Altair Nanomaterials Inc.) holds all of our interest in our nanomaterials and titanium dioxide pigment technology and related assets. Altairnano, Inc. also owns Altair China, a WFOE in China, and Altair China owns Northern Altair, a domestic company in China.

Corporate History

Altair Nanotechnologies Inc. was incorporated under the laws of the Province of Ontario, Canada in April 1973 for the purpose of acquiring and exploring mineral properties. At that time, its name was Diversified Mines Limited, which was subsequently changed to Tex-U.S. Oil & Gas Inc. in February 1981, then to Orex Resources Ltd. in November 1986, then to Carlin Gold Company Inc. in July 1988, then to Altair International Gold Inc. in March 1994, then to Altair International Inc. in November 1996 and then to Altair Nanotechnologies Inc. in July 2002. In July 2002, Altair Nanotechnologies Inc. domesticated from the Ontario Business Corporations Act to Canada's federal corporate statute, the Canada Business Corporations Act. On May 15, 2012, Altair Nanotechnologies Inc. domesticated from Canada to the State of Delaware under the Delaware General Corporation Law.

During the period from inception through 1994, we acquired and explored multiple mineral properties. In each case, sub-economic mineralization was encountered and the exploration was abandoned. Beginning in 1996, we entered into leases for mineral property near Camden, Tennessee and owned the rights to the Altair jig. However, we have

terminated our leases on all of the Tennessee mineral properties and during 2009 disposed of the remaining centrifugal jigs and abandoned the applicable patents since we were unable to identify an interested party to purchase them.

In November 1999, we acquired all the rights of BHP Minerals International, Inc., or BHP, in the nanomaterials and titanium dioxide pigment technologies and the nanomaterials and titanium dioxide pigment assets from BHP. We are employing the nanomaterials technology as a platform for the production and sale of metal oxide nanoparticles in our nano lithium titanate batteries.

In November 2010, we completed a 1-for-4 reverse stock split. All share and per share amounts included in this filing have been restated for the effects of this reverse stock split.

In July 2011, Energy Storage (China), an indirect subsidiary of Canon, acquired 37,036,807 shares of common stock, representing 53% of the outstanding shares of common stock of Altair Nanotechnologies Inc.

In December 2012, we completed a 1-for-6 reverse stock split. All share and per share amounts included in this filing have been restated for the effects of this reverse stock split.

Employees

Our business is currently managed by Mr. Alexander Lee, Chief Executive Officer, Mr. Liming (Albert) Zou, President, Mr. Stephen B. Huang, Chief Financial Officer and Dr. Bruce Sabacky, Chief Technology Officer. As of December 31, 2012, our U.S. operations has 70 employees and our China operations has 20 employees and we have employment agreements with Messrs. Lee, Zou, Huang and Sabacky. During 2013, we anticipate hiring additional employees primarily in operations, engineering and sales in China. Such additional hiring, if it occurs, will be dependent upon business volume growth.

Available Information

We file annual, quarterly and current reports and other information with the SEC. These materials can be inspected and copied at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Copies of these materials may also be obtained by mail at prescribed rates from the SEC's Public Reference Room at the above address. Information about the Public Reference Room can be obtained by calling the SEC at 1-800-SEC-0330. The SEC also maintains an Internet site that contains reports, proxy information statements, and other information regarding issuers that file electronically with the SEC. The address of the SEC's Internet site is www.sec.gov.

We make available, free of charge on our Internet website located at www.altairnano.com behind the "Investors" tab under "SEC Filings," our most recent Annual Report on Form 10-K, our most recent Quarterly Report on Form 10-Q, any current reports on Form 8-K filed since our most recent Annual Report on Form 10-K and any amendments to such reports as soon as reasonably practicable following the electronic filing of such report with the SEC. In addition, we provide electronic or paper copies of our filings free of charge upon request.

Forward-Looking Statements

This Report contains various forward-looking statements. Such statements can be identified by the use of the forward-looking words "anticipate," "estimate," "project," "likely," "believe," "intend," "expect," or similar words. These stat discuss future expectations, contain projections regarding future developments, operations, or financial conditions, or state other forward-looking information. When considering such forward-looking statements, you should keep in mind the risk factors noted under "Risk Factors" below and other cautionary statements throughout this Report and our other filings with the SEC. You should also keep in mind that all forward-looking statements are based on management's existing beliefs about present and future events outside of management's control and on assumptions that may prove to be incorrect. If one or more risks identified in this Report or any other applicable filings materializes, or any other underlying assumptions prove incorrect, our actual results may vary materially from those anticipated,

estimated, projected, or intended.

Item 1A. Risk Factors.

An investment in our shares of common stock and related derivative securities involves significant risks. You should carefully consider the risks described in this Report before making an investment decision. Any of these risks could materially and adversely affect our business, financial condition or results of operations. In such case, you may lose all or part of your investment. Some factors in this section are forward-looking statements.

We may continue to experience significant losses from operations.

We have experienced a net loss in every fiscal year since our inception. Our loss from operations was $18.6 million for the twelve months ended December 31, 2012. We may never be profitable in the future. Even if we are profitable in one or more future years, subsequent developments in the economy, our industry, customer base, business or cost structure, or an event such as significant litigation or a significant transaction, may cause us to again experience losses.

We may not be able to raise sufficient capital to finance our operations due to our operating results, market conditions and similar factors.

As of December 31, 2012, we had approximately $12.4 million in cash and cash equivalents. In addition, we received a cash grant of $11.8 million, which we received from Wu'an as part of our economic development deal; however, this capital is earmarked for the development of our operations in Wu'an, China, and is thus treated as restricted cash. As a result, we expect that in the future we will again need to raise capital. With respect to any such capital raise, we may be unable to raise the amount of capital needed and may be forced to pay an extremely high price for capital. Factors affecting the availability and price of capital may include the following:

- market factors affecting the availability and cost of capital generally, including increases or decreases in major stock market indexes, the stability of the banking and investment banking systems and general economic stability or instability;
- the price, volatility and trading volume of our shares of common stock;
- our financial results, particularly the amount of revenue we are generating from product sales;
- the market's perception of our ability to execute our business plan and any specific projects identified as uses of proceeds;
- our ownership structure and recent or anticipated dilution;
- the amount of our capital needs;
- the market's perception of our company and companies in our line of business; and
- the economics of projects being pursued.

If we are unable to raise required capital, we may be forced to discontinue operations.

We have entered into contractual provisions that may significantly limit our ability to raise capital.

In conjunction with the closing of purchase by an affiliate of Canon Investment Holdings Ltd. of shares representing over 50% of our outstanding shares in 2011, we granted certain rights to Canon, including the right to proportional representation on our Board of Directors, certain registration rights, and an option to purchase a sufficient number of our equity securities at market price to maintain their percentage of ownership should we offer, sell or issue new securities. These rights may dissuade potential investors from purchasing our capital or may require us to accept less than favorable terms in future financings.

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Laws governing repatriation of investments in a China WFOE may contribute to a need to obtain capital to finance our non-China operations in the near future.

We have established a Wholly Foreign Owned Enterprise, or WFOE, in China through which we conduct our Chinese operations. When establishing a WFOE, we have been required to designate a minimum registered capital amount and contribute at least such amount to the WFOE. Chinese law severely limits the ability of a WFOE to repatriate money to its non-Chinese parent. In general, any distributions to the non-Chinese parent must derive from profits, as determined in accordance with Chinese accounting standards and regulations. Our WFOE will also be required to set aside at least 10% of its after-tax profit based on Chinese accounting standards each year to a statutory surplus reserve fund until the accumulative amount of such reserve reaches 50% of registered capital.

These reserves are not distributable as dividends. In addition, our WFOE may be required to allocate a portion of its after-tax profit to a staff welfare and bonus fund. Moreover, if our WFOE incurs debt on its own behalf in the future, the instruments governing the debt may restrict our WFOEs' ability to pay dividends or make other distributions to us. Any limitation on the ability of our WFOE to distribute dividends and other distributions to us could materially and adversely limit our ability to make investments or enter into joint ventures that could be beneficial to our business, pay dividends, or otherwise fund and conduct our business.

We may become subject to international economic and political risks over which we have little or no control and may be unable to alter our business practice in time to avoid the possibility of reduced revenues.

We conduct a portion of our business outside the United States and plan to significantly increase our presence in China. Doing business outside the United States, subjects us to various risks, including changing economic and political conditions, major work stoppages, exchange controls, currency fluctuations, armed conflicts and unexpected changes in United States and foreign laws relating to tariffs, trade restrictions, transportation regulations, foreign investments and taxation. We have no control over most of these risks and may be unable to anticipate or adapt to changes in international economic and political conditions. This may lead to sudden and unexpected revenue reductions or expense increases.

China's economic policies, laws and regulations could affect our business.

Our business plan currently anticipates that a substantial portion of our assets will be located in China and a portion of our revenue will be derived from Chinese operations. Accordingly, our results of operations and prospects will become subject, to a significant extent, to the economic, political and legal developments in China.

While China's economy has experienced significant growth in the past twenty years, such growth has been uneven, both geographically and among various sectors of the economy. The PRC government has implemented various measures to encourage economic growth and guide the allocation of resources. Some of these measures benefit the overall economy of China, but they may also have a negative effect on us. For example, operating results and financial condition may be adversely affected by the government control over capital investments or changes in tax regulations. The economy of China has been transitioning from a planned economy to a more market-oriented economy. In recent years, the PRC government has implemented measures emphasizing the utilization of market forces for economic reform and the reduction of state ownership of productive assets, and the establishment of corporate governance in business enterprises; however, a substantial portion of productive assets in China are still owned by the PRC government. In addition, the PRC government continues to play a significant role in regulating industry development by imposing industrial policies. It also exercises significant control over China's economic growth through the allocation of resources, the control of payment of foreign currency-denominated obligations, the setting of monetary policy and the provision of preferential treatment to particular industries or companies. Any adverse change in the economic conditions or government policies in China could directly harm our business or harm overall

economic growth in China, which in either case could increase our expenses and decrease expected revenues.

We may have difficulty establishing adequate management, legal and financial controls internationally.

As a result of difference in management, accounting, legal, language and cultural norms, we may experience difficulty in establishing management, legal and financial controls, collecting financial data and preparing financial statements, books of account and corporate records and instituting standard business practices for our international projects as well as in our China-based operations. In addition, our international efforts may divert management attention and consume a significant amount of capital without anticipated results.

If relations between the United States and China worsen, investors may be unwilling to hold or buy our stock and our stock price may decrease.

At various times during recent years, the United States and China have had significant disagreements over political and economic issues. Controversies may arise in the future between these two countries. Any political or trade controversies between the United States and China, whether or not directly related to our business, could reduce the price of our common stock.

China could change its policies toward private enterprise or even nationalize or expropriate private enterprises.

Our business is expected to be subject to significant political and economic uncertainties and may be affected by political, economic and social developments in China. Over the past several years, the PRC government has pursued economic reform policies including the encouragement of private economic activity and greater economic decentralization. The PRC government may not continue to pursue these policies or may significantly alter them to our detriment from time to time with little, if any, prior notice.

Changes in policies, laws and regulations or in their interpretation or the imposition of confiscatory taxation, restrictions on currency conversion, restrictions or prohibitions on dividend payments to shareholders, or devaluations of currency could cause a decline in the price of our common stock.

The nature and application of many laws of China create an uncertain environment for business operations and they could have a negative effect on us.

The legal system in China is a civil law system. Unlike the common law system, the civil law system is based on written statutes in which decided legal cases have little value as precedents. The promulgation of new laws, changes of existing laws and the abrogation of local regulations by national laws could cause a decline in the price of our common stock. In addition, as these laws, regulations and legal requirements are relatively recent, their interpretation and enforcement involve significant uncertainty. Furthermore, the political, governmental and judicial systems in China are sometimes impacted by corruption. There is no assurance that we will be able to obtain recourse in any legal disputes with suppliers, customers or other parties with whom we conduct business.

Following the acquisition of a majority interest in the company by an affiliate of Canon, we face risks associated with having a majority shareholder.

In July 2011, an affiliate of Canon acquired a majority of our outstanding shares of common stock, which presents certain risks to us, including the following:

- The majority shareholder controls the appointments on the Board of Directors and may appoint persons less qualified, or more loyal to the majority shareholder, than would be appointed absent a controlling shareholder;
- The majority shareholder may be able to influence our Board of Directors to enter into transactions with related or third parties that are more favorable to such parties than would be negotiated by an independent Board of Directors;
- The majority shareholder controls all matters requiring approval by the shareholders, including any determination with respect to the acquisition or disposition of assets, future issuances of a material number of securities and other major transactions; and
- This concentration of ownership may also delay, defer or prevent a change in control and otherwise prevent shareholders other than our affiliates from influencing our direction and future.

If one or more of these risks, or other risks, materializes, our business will be harmed, and it may be harmed materially.

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Cultural, language and other differences between the U.S. and China may create inefficiencies in our management and operations.

Our majority shareholder, and a majority of our directors, are Chinese, reside in China and two of our directors exclusively speak Chinese. As we ramp up our China-based operations,, we may experience conflicts or misunderstandings within our management structure that are primarily or partially rooted in language and cultural differences, particularly differences in management and communication styles. Language and cultural differences may also affect strategy formation and create inefficient and limited communication among technical and management employees located in different countries. The occurrence of any of these events may harm our growth potential, increase costs and decrease operational efficiency.

We may not realize anticipated benefits from our agreement with Inversiones Energeticas.

In February 2011, we entered into a purchase contract with Inversiones Energeticas, S.A. de C.V., or INE, related to the purchase of a turn-key 10 megawatt ALTI-ESS advanced battery system for $18 million. Projected revenue under this agreement represented a substantial portion of our expected revenue in 2011 and represents a substantial portion of our projected revenue for 2012. On April 15, 2011, as a result of unexpected regulatory issues, INE notified us that they needed to cancel the contract in accordance with its terms. INE subsequently stated that such letter was not intended to effect a termination of the contract, but merely to provide notice of its initial failure to obtain regulatory approval, which would automatically effect a termination of the contract if the issue was not resolved within 120 days, subject to extension by the parties. We have entered into several extensions in order to allow the various parties additional time to resolve these regulatory issues. We may be unable to resolve the regulatory issues with the existing agreement or may otherwise be unable to enter into a new agreement with INE. If not, we will lose anticipated revenue and lose the expected marketing benefits we expected following the completion of the installation of the ALTI-ESS system. This will harm our short-term revenue projections and possibly our long-term revenue potential.

Our nano lithium titanate battery materials and battery business is currently dependent upon a few customers and potential customers, which presents various risks.

Our nano lithium titanate battery materials and battery business is dependent upon a few current or potential customers, including a small number of power producers, an affiliate of Canon and smaller companies developing electric or hybrid electric buses. In addition, many of these customers are, or are expected to be, development partners who are subsidizing the research and development of products for which they may be the sole, or one of a few, potential purchasers. As a result of the small number of potential customers and partners, our existing or potential customers and partners may have significant leverage on pricing terms, exclusivity terms and other economic and noneconomic terms. This may harm our attempts to sell products at prices that reflect desired gross margins. In addition, the decision by a single or potential customer to chose not to purchase or abandon the use or development of a product may significantly harm both our financial results and the development track of one or more products.

We depend upon several sole-source and limited-source third-party suppliers.

We rely on certain suppliers as the sole-source, or as a primary source, of certain services, raw materials and other components of our products. We do not yet have long-term supply or service agreements engaged with any such suppliers. As a result, the providers of such services and components could terminate or alter the terms of service or supply with little or no advance notice. If our arrangements with any sole-source supplier were terminated, or if such a supplier failed to provide essential services or deliver essential components on a timely basis, failed to meet our product specifications and/or quality standards, or introduced unacceptable price increases, our production schedule would be delayed, possibly by as long as one year. Any such delay in our production schedule would result in delayed product delivery and may also result in additional production costs, customer losses and litigation.

An area in which our dependence upon a limited number of sources creates significant vulnerability is the manufacturing of our nano lithium titanate cells. As of the date hereof, we have two contract manufacturing sources for our nano lithium titanate cells. We have had quality issues with both contract manufacturers. Our nano lithium titanate battery cells are the building blocks of all of our products (other than our nano lithium titanate powder). If we continue to experience quality issues with our suppliers, we may be unable to meet our deadlines, or quality specifications, with respect to existing or future orders. This would harm our reputation and our ability to grow our business.

Our operating results have fluctuated significantly in the past and will continue to fluctuate in the future, which could cause our stock price to decline.

Our operating results have fluctuated significantly in the past, and we believe that they will continue to fluctuate in the future, due to a number of factors, many of which are beyond our control. If in future periods our operating results do not meet the expectations of investors or analysts who choose to follow our company, the price of our shares of common stock may fall. Factors that may affect our operating results include the following:

- fluctuations in the size, quantity and timing of customer orders;
- timing of delivery of our services and products;
- additions of new customers or losses of existing customers;
- positive or negative business or financial developments announced by us or our key customers;
- our ability to commercialize and obtain orders for products we are developing;
- costs associated with developing our manufacturing capabilities;
- the retention of our key employees;
- new product announcements or introductions by our competitors or potential competitors;
- the effect of variations in the market price of our shares of common stock on our equity-based compensation expenses;
- disruptions in the supply of raw materials or components used in the manufacture of our products;
- the pace of adoption of regulation facilitating our ability to sell our products in our target markets;
- technology and intellectual property issues associated with our products;
- general political, social, geopolitical and economic trends and events; and
- availability of components sourced from Korea if tensions between North Korea and South Korea erupt into a greater military conflict.

Our patents and other protective measures may not adequately protect our proprietary intellectual property.

We regard our intellectual property, particularly our proprietary rights in our nano lithium titanate technology, as critical to our success. We have received various patents, and filed other patent applications, for various applications and aspects of our nano lithium titanate technology and other intellectual property. Such patents and agreements and various other measures we take to protect our intellectual property from use by others may not be effective for various reasons, including the following:

- Our pending patent applications may not be granted for various reasons, including the existence of conflicting patents or defects in our applications, if there was in existence relevant prior art or the invention was deemed by the examiner to be obvious to a person skilled in the art whether or not there were other existing patents. Risks associated with patent applications are enhanced because patent applications of others remain confidential for a period of approximately 18 months after filing; as a result, our belief that we are the first creator of an invention or the first to patent it may prove incorrect, as information related to conflicting patents is first published or first brought to our attention;
- The patents we have been granted may be challenged, invalidated, narrowed or circumvented because of the pre-existence of similar patented or unpatented intellectual property rights or for other reasons;
- The costs associated with enforcing patents, confidentiality and invention agreements or other intellectual property rights may make aggressive enforcement cost prohibitive;
- We have not filed for patent protection in many countries in which we are currently selling product or seek to sell product; as a result, we may be unable to prevent competitors in such markets from selling infringing products;

- Even if we enforce our rights aggressively, injunctions, fines and other penalties may be insufficient to deter violations of our intellectual property rights; and
- Other persons may independently develop proprietary information and techniques that, although functionally equivalent or superior to our intellectual proprietary information and techniques, do not breach