Written Statement of
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to the
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[Slide 1. Altairnano 'innovation at work']

Mr. Chairman, Members of the Committee, I want to thank you for the opportunity today to provide remarks concerning the potential of nanomaterials and nanotechnology to contribute significantly to the development of alternative energy technologies.

I am Alan Gotcher, President and CEO of Altair Nanotechnologies, Inc. and of Altair Nanomaterials, Inc. The former is a holding company, while the later is the operating company incorporated and based in Reno, Nevada. We are a fully American company, with all of our assets, facilities, and employees located in Nevada and Indiana. Altairnano, the trade name we go by, is a development-stage company whose general business involves the development and production of nano-structured metal oxides comprised of nano-sized particles. These nanomaterials, like our advanced battery-electrode materials for example, are being designed to dramatically improve existing products or stimulate the introduction of new products for unmet market needs.

[Slide 2. Altairnano Profile]

In 2000, when Altairnano was a small business with little revenue and 27 employees. We began to realize the promise of nanomaterials and that our proprietary, patented manufacturing process was uniquely suited for the industrial scale manufacture of a range of metal oxide nanomaterials. Since then, we have more than tripled our staff, increase revenues and plan to be cash-flow positive in 2007. Today, as a small publicly traded company, Altairnano is pursuing research and product development based upon nano-structured metal oxide nanomaterials in a number of fields, including pigments and coatings; sensors for chemical, biological and radioactive agents; pharmaceuticals for chronic kidney disease and enhanced drug delivery; and alternative energy storage products including high power lithium ion batteries and advanced hydrogen production.

The foundation of Altairnano lies in our intellectual property, our unique, patented processes for manufacturing and composition of matter patents for nano-structured metal oxides with unsurpassed quality, performance and cost. Today, Altairnano is a company lead by strong management with track records for commercializing new technology, with. We have over 70 employees the majority of whom are scientists and product developers complemented by strong manufacturing, marketing and sales personnel. It is the intellectual power of this team that has made our advances possible. Altairnano has 33 patents issued and over 100 patent applications have been based on Altairnano's own research and development. The quality of our market partners include, for example, Eli Lilly, Western Oil Sands, Sulzer Metco and other tier one automotive suppliers and aerospace companies that confidentiality agreements prevent disclosure is testimony to the commercial promise of our products and the quality of our company. As Altairnano moves our nanomaterials from the laboratory to commercial-scale production, it is increasingly our intent to manufacture in the United States due to its policies that strongly support entrepreneurship and protects company Intellectual Property.

Nano Lithium Ion Batteries

[Slide 3. Altairnano, imagine the possibilities…]

Today, however, I want to focus on what has, in the past year, become Altairnano's leading effort and one that embodies the most near-term potential for significant real world applications. This effort is to develop an advanced nano-structured material and battery that will set a new baseline standard in energy storage and power delivery. Altairnano is developing the most advanced lithium ion battery in the world: high performance, affordable and environmentally sustainable, Altairnano's high power, advanced Li-ion batteries outperform conventional and other experimental battery concepts.

Altairnano's lithium ion batteries have remarkable performance:

- Power for rapid vehicle acceleration,
  - More power than NiCd, NiMH, Li Ion or lead acid batteries
- Rapid battery recharge, in just a few minutes
- Capable of operation over wide temperatures, as low as -40°C to +65°C
- A long life battery, est. to be at least 15 years or five time longer than most batteries
- An inherently safe battery, with no catastrophic failures in any safety test
- And the batteries contain no hazardous materials.

This is a major breakthrough in battery performance, a unique combination of attributes not seen in any competing battery technology. This battery performance has been measured in Altairnano's product applications labs and those of quality third party partners.

I believe it will take such a major breakthrough in electrical storage and power management if our country is to make tangible, near-term achievements in reducing our nation's increasing dependence on foreign sources of petroleum and natural gas, and thereby enhancing national security, while also reducing the amount of carbon dioxide and other greenhouse gases that are produced by our growing energy consumption without curtailing our growing economy.

Batteries, in a multitude of sizes and shapes, will be a major factor in reducing the wasteful use (and hence, wasteful production) of energy while allowing more-than-sufficient power to be stored where it is needed and available when it is needed. Batteries will also be key to the migration of the transportation sector to electricity, and away from liquid fuels, with all of the sourcing, production, transportation and storage issues associated with liquids, especially petroleum. Why? Batteries are energy storage and transfer media. Batteries enable end-users of power to utilize the energy stored in and generated from of a wide variety of sources: solar, wind, biomass, geo-thermal, nuclear, natural gas, coal or petroleum. Thus batteries are a major element of introducing flexibility into the entire electricity system, from generation through distribution, storage, and ultimately, end use. Imagine a future where an electric vehicle has a range of 300 miles and the battery can be recharged in a few minutes. This would allow you to drive your all electric vehicle from New York to Los Angeles recharging, or re-fueling, along the way using electricity generated locally, first from nuclear power, then from clean-coal and biomass or biofuels; moving further west you

recharge with electricity generated at hydro-electric plant, a solar panel farm in the desert and a wind farm in the Rockies before moving to the coast and gaining the benefits of tidal and geo-thermal electrical generation.

To fulfill this potential, batteries must meet a wide spectrum of operational and economic demands, which until now batteries have not been able to do with much success. This is where nanomaterials have a potentially huge contribution to offer across the whole range of alternative energy technologies.

Characteristics of Altairnano's Lithium Titanate Spinel based Lithium Ion Batteries

[Slide 4. Altairnano Battery Performance]

Although Altairnano's nano-structured materials have utility in a wide variety of market applications, for example as pharmaceutical APIs and in drug delivery, Altairnano's near- to mid-term business strategy is to exploit the unique characteristics of our nano-structured metal oxides in several fields of alternative energy. Here I would like to highlight what Altairnano's battery technology offers in the way of improved capabilities for storing electricity and providing immediate, high-quality, continuous power on demand in virtually any circumstance. Altairnano offers more power than competing battery technologies and the benefits of an inherently safe and light weight lithium ion battery.

[Slide 5. Altairnano nano-lithium titanate spinel]

Our battery technology utilizes nano-structured lithium titanate spinel as the electrode material in the anode of a rechargeable lithium ion battery. It replaces the graphite electrode used in conventional lithium ion batteries, which is the source of performance and safety issues. Altairnano's technology produces 25 nm particles that are fused into 3 micron aggregates uniform in size and shape. This size is ten to forty times smaller than any other source of lithium titanate in the world.

[Slide 6. Altairnano battery comparison chart]

Smaller particles provide increased surface area, which translates into vastly faster discharge and charge rates, meaning that the time for recharging the battery can be measured in minutes rather than in hours. Altairnano's electrode materials also improve the useful lifetime of a battery, called cycle life as measured in thousands rather than hundreds of cycles, 10 to 20 times longer than current lithium batteries. The nano-structured materials also provide battery performance at -40°C to provide power at far below freezing temperatures, expanding the operational temperature range beyond what is currently achievable--over 75% of normal power will be available at extremes of -40°C and +75°C. Because conventional Li-ion batteries can not charge at temperatures below 0°C and they explode at temperatures higher than +110°C, this latter characteristic alone will permit Altairnano's lithium batteries to be used in physical environments that today cannot be served by lithium ion batteries due to safety concerns or because they require complex, expensive electronic control circuitry and temperature maintenance. Altairnano's battery material is inherently safe for humans and the environment; it is not hazardous in any sense, there are no hazardous disposal issues involved in its use and it will not explode or catch fire under any circumstances.

Automotive Applications

So what does this new material, lithium titanate spinel, mean to the commercial battery world? Let's take automotive design. Advanced batteries of the type Altairnano is developing will enable the US auto industry to "leapfrog" the next generation of hybrid drive vehicles, where the US industry and its technology are behind its Asian competitors. An Altairnano battery sized for an average 5-passenger sedan will permit auto makers to design an all-electric vehicle with no sacrifice in the performance, comfort or carrying capacity of today's internal combustion engine cars. Think of this: a 250-350 mile driving range, with maximum operational performance over that entire distance; a recharge time, from discharge to full recharge, in under 8 minutes (or about the time it takes to fill the tank of a large SUV); the ability to recharge from a 120-volt source; a battery that is completely safe from explosion or leakage of hazardous contents, eliminating those risk factors in the event of collisions; the ability to distribute the battery around various locations in the vehicle, meaning no reduction in passenger or luggage carrying space; and not least, no emissions of CO_2. As an indirect benefit, we will not have to compromise technical and economic competitiveness in the auto industry in order to have cleaner air.

Such vehicles are not 20 years away, unless the automotive manufacturers decide to take that long to design and produce them. Technically, they are just around the corner. What will the widespread adoption of such batteries mean for transportation, even accepting the intermediate step of hybrid-drive electric/gasoline vehicles? It means that cars and trucks can be fueled from electricity generated here in the U.S., rather than from petroleum pumped in other countries. It means safer, quieter, non-polluting vehicles that perform as well or better than today's vehicles. It means that the vast amounts of money required for new refineries, or for a national hydrogen fueling system, or for liquid natural gas terminals can be diverted to other purposes, private and public. Some of the money would be used to accelerate research into clean coal and to speeding up deployment of renewable energy technologies and improving them. But what it would mean most of all is greater security for our people—we would be much more in control of our transportation destiny, and thus of our economy and our national security. Our foreign policy would be that much freer from the specter of supply interruption, price manipulation, sabotage, wars, and outright blackmail that it currently has to contend with.

How could Congress, and especially the Commerce Committee, have a seminal role in transforming our economy? If Congress could encourage the US automotive industry to embrace the concept of electric vehicles, including a substantial component of all-electric vehicles in its production mix now – this is a classic chicken and egg situation - such action would stimulate tremendous competition to supply the development of alternative energy production technologies that could serve immediate local demand. It would again be an exciting time to be an innovator and entrepreneur in the US.

Stationary Power Applications

Let's take two other commercial applications for our advanced high power, lithium ion battery, in the field of stationary power: Uninterruptible Power Supply (UPS) and Emergency Back-up Power (EBP). Present day UPS and EBP systems utilize mostly lead-acid batteries, for their low initial cost and their reliability. Yet lead-acid batteries must be replaced every 2-3 years, and there are hazardous materials issues around their manufacture, handling and maintenance. Lead acid batteries are also unreliable and lose charge quickly in extreme temperatures (<0°C and >50°C). Also the quality of power declines steadily with use, as does the ability to accept a recharge. By comparison, early results on prototype batteries using Altairnano's nano-structured lithium titanate electrode materials show that such an

advanced lithium ion battery is virtually unaffected by temperature extremes; its charge is fully available, immediately, and can accept a full re-charge in a few minutes—thus acting much like a hybrid ultra capacitor;it has a much longer lifetime, with no decline in performance; there are no hazardous materials issues; and, using the Altairnano processing method, the battery material in wide production will be economically competitive with lead acid or other competing battery technologies.

With these kinds of advantages, UPS and back-up systems could feasibly become reliable components of distributed mini-grids, linked to the national power grid in ways that would tremendously enhance electric reliability and national security. Batteries of the type being developed by Altairnano are necessary for the implementation of any large-scale alternative energy generation and delivery system. Storage of electrical power generated either by wind or solar power for use when the wind isn't blowing or the sun isnot shining requires such batteries. And consider, such batteries incorporated into large buildings will enable these buildings to become nighttime storage nodes in a distributed grid system to even out supply & demand and enhance reliability during periods of excess demand.

Military Applications

On Sea

Altairnano's nano-enabled lithium ion batteries have tremendous prospects for moving alternative energy technologies into military applications, and thus into national security calculations and into both strategic and tactical operational planning. To offer one example, ships in today's Navy generally have three on-board generators that power the turbines that drive the ships. For security—to be absolutely sure that power is available and on tap instantly whenever needed—the ships run two of the generators at all times, one for operations and one for instant backup. If the Navy could install a battery system with the operational characteristics of Altair's battery, ships could forego having a second generator operating 24 hours a day, thus cutting their fuel use by 15-20%, or approximately $1 million for a six-month cruise by a single destroyer or frigate. One of the Navy's chief strategic operational goals over the next decade is to reduce fleet fuel consumption significantly. More fuel used means fewer ships at sea, fewer days of the year, in fewer parts of the world.

Down the road, the Navy is contemplating a new generation of all-electric drive ships that would use fuel cells as the power source for the ship's drive and all ancillary functions. For fuel cells to become feasible, however, there is a need for a source of instant power-on-demand, sustainable for up to half an hour in order for the fuel cells to reach their normal operational temperature. Altairnano's new nano-enabled lithium ion battery materials can provide a near-term solution that will meet all of the future operational requirements of the Navy; all within a relatively small footprint and being very cost competitive with battery technologies offering less operational capability.

On Land

Moving down to ground level operations, the Army's Soldier of the Future will carry an array of electronically-powered equipment, from communications, to navigation, to all-weather vision, to climate-controlled environmental body suits, to laser weapons. That means he'll have to carry his own power source—a lot of power, high quality power, instant, reliable and safe in any environmental condition. Right now, the US Army infantry moves on small primary lithium batteries, not rechargeable. During the invasion of Iraq, literally millions of batteries were used and discarded on the battlefield; and it was discovered after the invasion that the Army was within days of literally running out of batteries or power. Soldiers don't

use rechargeable batteries today because the recharge time is too long and the depth of charge after the first use is unreliable. So a substantial portion of their personal gear and of logistics supply trains is devoted to carrying batteries. That becomes less and less sustainable as the individual soldier's needs, and those of the accompanying tactical vehicles, require more power. So the Army is very interested in batteries that can provide instant, reliable, high-energy power in a lightweight, rechargeable, low-cost, long-lasting format. Early testing of prototype batteries made using Altairnano's nano-LTO electrode materials show that this is an area where nanomaterials will provide game-changing performance: they will power the U.S. foot soldier of the future.

In the Air

In another scenario, think of airplanes, missiles, and spacecraft, all need reliable power-on-demand, with very quick discharge rates, in batteries that can withstand temperature extremes without any serious degradation of capability and that will have greatly extended service and charge/discharge cycle lives. Testing results with early prototype battery designs have shown that Altairnano's nano-structured lithium ion batteries can be used to replace currently-used batteries, with no compromise in performance while significantly reducing power-pack weight and footprint, thus allowing for larger payloads, increased speeds, or extended range. What's the worth of an extra fifty pounds of payload for a satellite? Or, an extra 50 miles of range for a tactical missile? Or an extra few hours in the air for an unmanned observation plane?

The Role of Government

[Slide 7. Altairnano Imagine the Possibilities]

I cannot end my statement without acknowledging the critical role of government in assisting companies like Altairnano to carry out the research and development that has brought nanomaterials development and nanotechnologies to their present state of viability. Without the foresight, planning and hard work of dedicated public servants in the Executive Branch and in the Congress, it is questionable whether private industry would have taken on the challenges and made the investments that are beginning to provide the world with the benefits of nanotechnology. The National Nano Initiative, which originated in the minds of a few professionals at the National Science Foundation, has laid the groundwork for private industry to take the risks of developing and bringing products to markets. In our own example, Altairnano's development of advanced lithium ion battery materials benefited tremendously from the award of an NSF SBIR grant in 2004. Although our research on nano-LTO materials had been ongoing for several years, it was at a low level of effort. The NSF grant really kick-started our program. The results of that NSF-funded research led directly to our decision to hire a full-fledged battery team and make a commitment to nanoparticle-based battery materials as our top corporate priority. Without that small grant, we would not be here today. Similar stories can be told by many, many small, development-stage nanomaterials and nanotechnology companies working in the various fields of alternative energy.

Increasingly, over the past 18 months, concerns have been raised related to the safety of some nanomaterials and calls for government oversight of the emerging nanomaterials industry in areas of environment, health and safety (EHS). Altairnano has chosen to be an industry leader in working voluntarily with agencies like the Environmental Protection Agency and the National Institute for Occupational Safety and Health (NIOSH) to identify possible issues of concern in the manufacturing processes for our nanomaterials. We are strongly committed to the principle that our workers, workers at our marketing partners who

incorporate our enabling nanomaterials into their products and the consumers using those products will not come into contact with any even-potentially harmful materials during manufacture, use or disposal of such materials and products. We are working diligently to address whatever potential EHS issues might be related to those processes. NIOSH has not found any negative EHS factors involved in our nanomaterials or their manufacture and use, and we are confident that our products and processes will pass any reasonable standard of evaluation. The experience however has led us to think long and hard about how, not whether, nano-materials, products, and processes should be examined, evaluated and possibly regulated. We have submitted comments in response to the EPA's draft nano-EHS knowledge-gap white paper and are woking with a broad coalition of partners to promote a joint industry-government effort to establish a "roadmap" for EHS issues that sets priorities for identifying and dealing with potentially harmful nanomaterials, products, and companies while letting the United States' nanomaterials industry continue in its position of global leadership. If we collectively get this right, we will establish a global set of criteria for safe and sustainable development and use of nanomaterials in which US companies and technologies will have economic dominance.

We at Altairnano believe that nanotechnology will be the technological underpinning of economic growth in the 21st Century, and that it must be developed and exploited in a manner that is responsible and sustainable. While a regulatory framework needs to be developed that protects the environment, workers and consumers, it must be done in a way that neither bogs down the regulatory agencies nor cripples the development of nanoscience and technology in the US. We have some ideas, along the lines used by the Food and Drug Administration for regulating the development of new prescription drugs, for example. This is an oversight paradigm that increases in stringency as ideas move from the researchers' minds, through development, and become incorporated into commercial products. A considered and future-friendly approach needs to be developed in partnership with all stakeholders. Time is critical; we are already seeing alternative energy technologies and products first developed in the US go on to large scale deployment elsewhere—along with the economic benefit to industry that goes with scale.

Our present lead in nanotechnology can, and will, help the United States gain the lead in alternative energy technologies and their deployment, and thus lead to energy security. But there are serious roles for government, in collaboration with industry to foster the safe and responsible development of new nanomaterials and nanotechnologies, and to do so in a manner that provides positive support for this infant industry at a critical stage of its development.

Thank you, gentlemen for your time and your interest. And I invite you to visit our facilities in Indiana or Reno, Nevada. I'm prepared to answer any questions you may have.

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