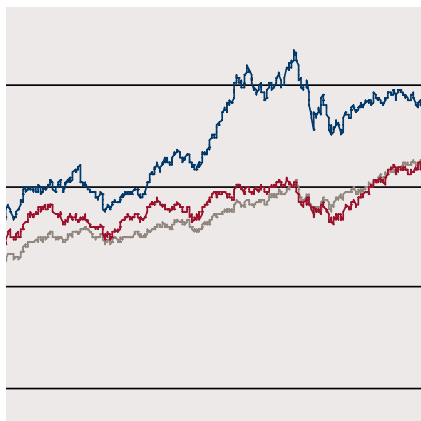


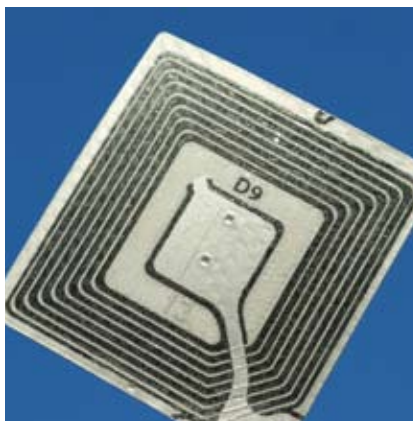
Nano Circle



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Investments in Nanotechnology

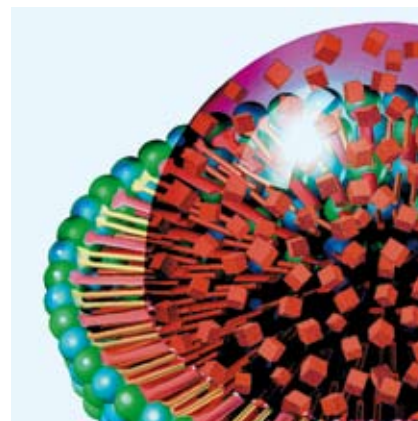
The Credit Suisse Global Nanotechnology Index helps investors to reach their goals



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High-Performance Energy Storage Devices

Our mobile society demands powerful batteries



Page 6

Nanoeffects

Nanotechnologies enhance color brilliance and intensity

Editorial



Giles Keating, Head of Global Research at Credit Suisse, talks about how these and other interesting developments in nanotechnology can be utilized for our investors. He reveals how our Credit Suisse Global Nanotechnology Index (CSGNI) is structured, why now is exactly the right time for such an index, and how it helps our investors to reach their goals.

Enjoy reading the newsletter, and let me know if you have any questions or feedback. Please write to me at the e-mail address nano.circle@credit-suisse.com or read more on our internet pages at www.credit-suisse.com/nano. It's well worth taking a look.

I look forward to continuing the dialogue.

It's a truly tempting idea: 100 kW performance, 160 km range, and only a 10-minute charge time. It's pleasing to note that, thanks to nanotechnology, energy storage has made this and many more innovations possible, or will make them possible in the near future.

In this Nano Circle newsletter, we highlight the possibilities that exist to alleviate one of the most important problems our modern society faces: energy storage. But the limits of this justified euphoria should also be pointed out.

Finally, in this, the 4th edition of our Nano Circle newsletter, we have another opportunity to present an exceptional Swiss company: Ciba, headquartered in Basel. With its products and specialty chemicals, Ciba has created a superb global reputation for itself in the field of nanotechnology. The nanotransporter Ciba TINODERM® particularly impressed me. Ciba has consciously elected to collaborate with start-ups and universities in order to achieve its great successes with the crossover nanotechnology. It sets a great example for Switzerland.

Dr. Arthur Vayloyan

Private Banking

Head of Investment Services and Products

The Credit Suisse Nanotechnology Index: Invest in the Ideas of the Future

Miroslav Durana, Head of Index Development and Nanotechnology Research, interviewed Giles Keating, Head of Research for Private Banking and Asset Management, about the new Credit Suisse Global Nanotechnology Index.

Miroslav Durana: Why did Credit Suisse create an index?

Giles Keating: We see nanotechnology as one of the most critical technological breakthroughs for the coming years. We estimate growth between 25 to 30 percent per year until 2010 leading to a market size of roughly 220 billion US dollars. This growth, the cross-sectoral impact, and the long-term nature of the nanotechnology theme lent itself well to the creation of an index. The timing is also right as the index's structure and rebalancing methodology give it the flexibility to respond as the markets for nanotechnology evolve and grow in both economic and social importance.

What is the composition of the Credit Suisse Global Nanotechnology Index?

The index is composed of the 25 largest and most liquid stocks in the five sectors: Nano Materials, Nano Electronics, Nano Tools, Nano Healthcare and Nano Energy. Each sector is weighted according to the market size expected for each sector by 2010 to represent between 10 and 30 percent of the index. We defined the companies that make up the nanotechnology universe to be those that have at least 10% of their sales derived from nanotechnology or that display significant leadership in the field through patents, first-mover advantage, research programs, or other means. As the latter is a soft criterion, the emphasis is really on if the company is realizing sales revenue from nanotechnology-enabled products.

Nanotechnology is still in its early stages. Is it too early for an index?

No, in our view, it isn't, and in fact, the key feature of the Credit Suisse Global Nanotechnology Index is that it is rebalanced every six months to shortlist the new market leaders in each sector. This dynamic element of the index is critical to keep pace in the rapidly changing



Giles Keating is convinced of the economic and social importance of nanotechnology

markets for nanotechnology and provides the ability to react to various corporate actions like IPOs and new nanotechnology initiatives from existing corporations. If a new leader emerges for an application, it would likely be caught in this process just as a company that is losing potential would be dropped. As companies grow and develop, so will their role in the index. It is critical in such a fast-paced new technology to have the means to be agile, and this is why we pursued this type of index design.

What role will nanotechnology play in the future?

Nanotechnology is the next frontier in

technological development. What's exciting about it is that nanotechnology is an enabling technology. The invention of the microscope allowed us to see objects in the world around us at the micro scale for the first time and this opened up the gates for the discovery of the cell and microtechnology. Nanotechnology gives us the analogous and revolutionary ability to observe, manipulate, and characterize structures at this extraordinarily small scale where the Newtonian laws of physics break down and quantum mechanics become essential, blurring the differences between the sciences. This enables you to think outside the Newtonian box in this cross-disciplinary, new way to innovate.

What is driving growth in nanotechnology?

The growth drivers include expectations of a higher quality of life, concerns for the environment, high energy demand, and overall sustainable development. We can envision personalized medicine and ultra rapid diagnostics and therapeutics that reach the world's needs in cost-effective ways. The technology will soon deliver products like car batteries that propel an electric car for 160 km and fully charge in just 10 minutes, and coatings that make de-icing your car in the winter easy already exist. But these examples are just the beginning. There are much greater benefits that nanotechnology might enable in the future.

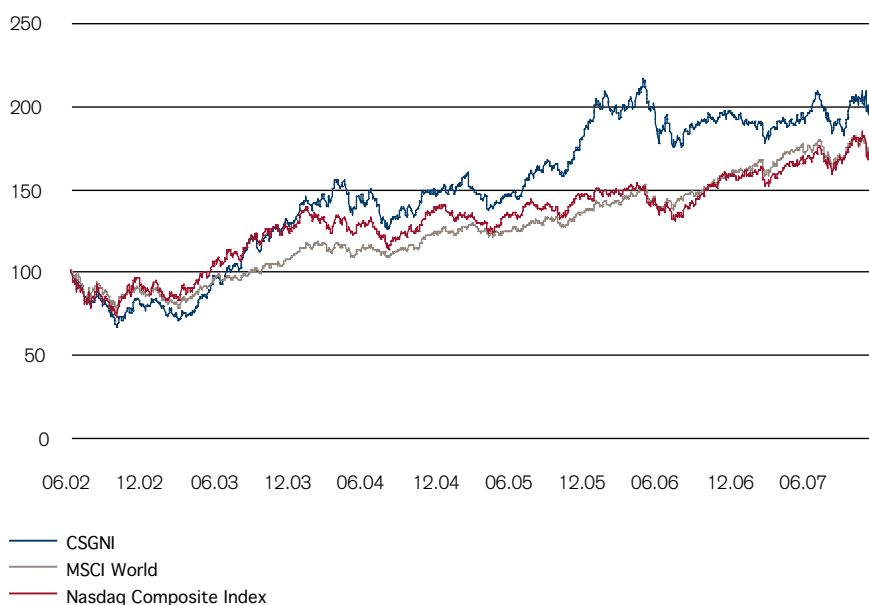
Which sectors are the most advanced in terms of products?

Nano information technology has seen many advances recently, with one of the more exciting being Sony's new organic-LED-based High Definition TV. The 11-inch version is only 3 mm thick. Nanomaterials is another very advanced sector and there are several new products like stain-proof textiles, graffiti-proof paints for outdoor applications, and mold-proof and antibacterial paints for indoor applications.



The Sony XEL-1 is the first television with an organic display

Performance of the Credit Suisse Global Nanotechnology Index (CSGNI)



Anticipating the Revolution

The Credit Suisse Global Nanotechnology Index is a dynamic vehicle representing the main nanotechnology sectors. It is a tradable and investable instrument designed to reflect the expected double-digit growth rates in the key nanotechnology sectors. From an investor's view, the Credit Suisse Global Nanotechnology Index enables financial exposure to an industry whose economic and social importance will steadily increase, and is suitable for long term investors.

Nanotechnology for the Energy Storage Systems of the Future

An increasingly mobile society demands more and more efficient methods of energy storage. Nanotechnology could hold the key.



Electric cars of the future: environmentally friendly and powerful thanks to innovative batteries

Modern hybrid automobiles save a considerable amount of fuel based on highly developed technologies that combine an internal combustion engine with an electronic motor. However, the development of an effective battery for vehicles powered solely by electricity would render this costly technology obsolete. The ideal electronic energy storage device for the electric car of the future will have to meet very high standards: with a capacity of 100 kw, the storage system would have to enable vehicles to be propelled for distances of over 160 km, thus making electric cars suitable for long-distance travel. In addition, the charge time should be under 10 minutes, while the weight and price of the battery should be as low as possible.

Wealth of Innovative Applications

There is also ever-increasing demand from the consumer electronics industry for improved energy storage systems. Mobile phones have essentially evolved into multimedia devices, while new, enhanced-performance laptops consume more energy than their slower predecessors. In addition, there is a range of

promising new applications, including the much-anticipated electronic paper, medical technology sensors, textile-integrated electronic components, as well as RFID transponders (product identification via radio frequency) and smart cards. All of these applications rely on ultra-light, efficient batteries.

Chemical Processes Are Key

With the aid of nanotechnology, researchers and companies worldwide are attempting to develop the battery of the future to tailor-made specifications. In order to achieve shorter charge times and higher battery performance, the chemical reactions within the battery must be accelerated. This can be accomplished either by optimizing the viscosity of the electrolytes or by magnifying the reaction surfaces of the electrodes.

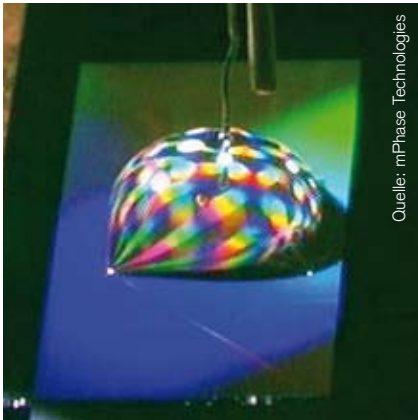
The US companies Altair Nanotechnologies and Advanced Battery Technologies have already had some initial success in this area. By incorporating nano-titanate materials, Altair's NanoSafe™ Battery aims to achieve charge times of only a few minutes. Currently, battery life

remains a problem; when batteries are fully discharged in each charge cycle, battery life is too short for commercial use in automobiles.

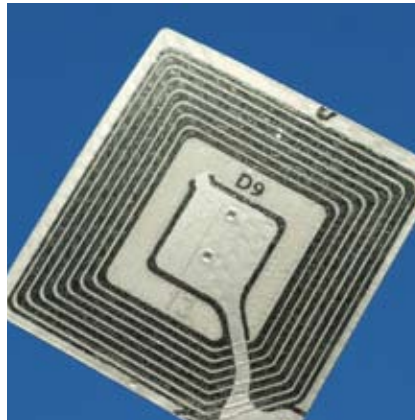
Energized "Thin Films"

Various modern battery technologies focus on miniaturization, as well as the reduction of cost and weight. So-called thin-film batteries, such as those being developed by OakRidge Micro-Energy, are comprised of a number of wafer-thin metal and oxide layers, which can be fabricated in practically any shape or size. Consequently, these batteries are designed to offer clear cost advantages for small-scale applications. In addition, given that these devices do not require critical chemical base materials, no robust casing is necessary. This makes the battery substantially lighter than conventional devices.

Devices using organic materials are also very promising. Recently, researchers at Tokyo's Waseda University successfully created a battery using a polymer film with a thickness of only 200 nanometers. Within this organic battery, so-called



Electrolyte on “nanograss”: The droplet does not moisten the area below it, as surface tension prevents the permeation of the nanotubes



RIFD-transponders for product identification via radio frequency



Smart Card

nitroxide radical groups act as charge carriers. Based on this architecture, the battery achieved one thousand charge and discharge cycles with practically no capacity loss.

Paper-Thin Batteries

Researchers at the Rensselaer Polytechnic Institute in Troy, New York, have also recently developed an ultra-thin, rechargeable energy source, by infusing cellulose – basically cardboard – with carbon nanotubes. The battery’s electrolyte is a liquid salt, providing the paper battery with the ability to function at temperatures from minus 70 degrees to plus 150 degrees Celsius. In addition, the total power output can be increased by simply stacking the paper batteries, and the entire bundle can then be cut or rolled into any number of shapes. The researchers are currently working on a method of mass production for this energy source – a printing process similar to that used for newspapers is conceivable. This would allow the batteries, which are made of harmless materials, to be manufactured on an extremely cost-effective basis.

No Unwanted Battery Discharge

The US company mPhase is taking a similar approach: The electrodes of the company’s nano-batteries are located at the bottom of a field of “nanograss”, which is comprised of nanotubes placed at regular intervals. The battery’s liquid electrolyte falls between these nanotubes only when activated. When idle, however, surface tension prevents the electrode contacts from moistening, thus breaking the internal circuit. As a result, the battery no longer discharges when not in use and thus can be stored for an infinite length of time.

In recent decades, there has been a quantum leap in terms of the miniaturization and improvement of electronic devices. By contrast, battery technology remains at the initial stage of development in many areas. It is already becoming apparent that nanotechnology will play a central role in advancing this development process.

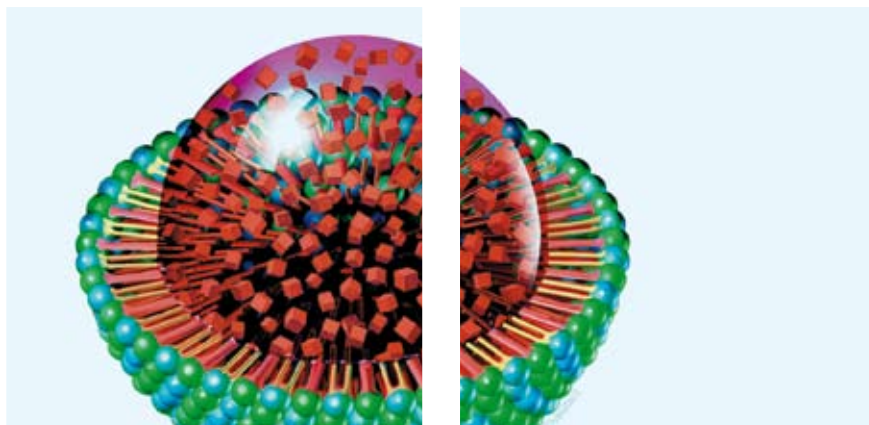
Dr. Dominik C. Müller, Equity Analyst
Nanotechnology & Alternative Energy

The Limits of Nature

In technological terms, there is a natural limit on the amount of energy per gram that can be stored in a battery. This limit is defined by the size of the chemical materials employed and the strength with which they bind their electrons. The targeted use of innovative chemical elements could enable, at most, a tenfold increase in this limit relative to today’s lithium ion cells. However, hundredfold or greater improvements are not possible due to the laws of nature. Higher energy density can be achieved in **nuclear batteries**, which derive their power from the radioactive decay of isotopes. As a result, nuclear batteries can constantly emit energy for up to 20 years. This principle has long been recognized and was already applied in the 1950s and 60s in satellite technology. In this area too, nanotechnology has paved the way for some remarkable advances. Consequently, the more widespread use of such energy storage devices across a range of applications is becoming more tangible.

Nanotechnology in Specialty Chemicals

The globally active company Ciba has decades of experience with products that utilize nanoeffects. In this area, the company's focus lies on nanomaterials such as coatings and emulsions.



Ciba TINODERM® with encapsulated active substances

Nanotechnology is more often associated with start-up companies than with a renowned firm like Ciba. However, Ciba has decades of experience in handling structures in the field of nanotechnology, and generates a significant amount of its revenues from products that utilize nanoeffects. The company's focus in this area lies in nanomaterials such as coatings and emulsions that offer nanoeffects but which are regarded, in terms of risk, in an entirely different light than free nanoparticles.

Ciba's first products with nanoeffects were transparent pigments and specific top-dispersions. In recent years, the company has broadened this range with the addition of a number of targeted new developments, including a special solar filter, a nano-transport system for the cosmetics industry, as well as innovative special pigments for liquid crystal displays, and effect pigments for the paint and printing ink industry. The company also envisages potential future applications for the automotive sector (scratch-resistant, self-cleaning paints), the electronics industry ("electronic paper"), as

well as energy and environmental technology (e.g. heat-absorbent surfaces).

Transport Vehicles for Active Substances

TINODERM® nanotopes are patent nanosystems that act as transport vehicles for active substances. In cosmetics, for example, the substances required for skin regeneration, such as vitamins A and E, can be transported to deeper skin layers, thereby maximizing their effect. Nanotopes are biodegradable and have been thoroughly investigated in terms of their safety. Their active delivery system is based on a membrane that is alternately comprised of conical and cylindrical molecules. This architecture guarantees the stability of the particles and also protects the encapsulated active substances.

Brilliant Colors

Thanks to intensive research, Ciba has been able to scale its traditional IRGAPHOR® pigments, which are used in automobile paints ("Ferrari red"), to nano dimensions for use in the electronics industry. These new particles are employed as color filters in liquid crystal

flat-screen displays and laptops, and are distinguished by their extraordinary color brilliance and intensity. In addition, the small size of the particles makes them transparent, i.e. a greater proportion of LCD background light reaches the surface. This reduces energy consumption and significantly increases the running time of battery-powered laptops.

Cooperation Is Key

Despite all of the successes it has achieved in the area, Ciba is not a nanotechnology company. Rather, this interdisciplinary technology is a tool used by Ciba to optimize the characteristics of its products. Alongside internal research, external cooperation is essential in order to turn these innovations into marketable products. Ciba already collaborates with a large number of leading start-ups and cooperates with more than 90 universities.

Dr. Martin Riediker,
Chief Technology Officer Ciba



Ciba

Ciba creates effects for a better quality of life: performance, protection, color and durability for a broad range of applications. The company operates globally in more than 120 countries, and generated sales of around CHF 6.4 billion in 2006. CHF 270 million of these revenues was invested in research and development.