BREAKTHROUGH TECHNOLOGY ALERT

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Thorium Will Power Your Profits (and Reduce Terror Risks)

By Patrick Cox

The new administration has assumed power, and markets are scrambling to reckon winners and losers. There will be plenty of both.

The Obama administration's promise to invest in green technologies, for example, will provide short-run benefits to companies working on alternative energies like solar, wind and ethanol production. That doesn't mean these are transformational technologies, though. The uninspiring goal of most is to compete, using tax breaks and subsidies, with coal. Such technologies do not create "monopolistic profits," in economists' jargon.

Politicians can't create the massive market conditions needed to generate transformational technologies. They can, however, block them, as the Bush administration hindered stem cell development. Today, however, we're going to focus on nuclear power. Then, I'll cover a few more critical topics. One is an unexpected and truly exciting development regarding stem cells, life extension and the new surgeon general.

The Anti-Nuke Movement

There is no energy shortage. The world abounds with easily accessible nuclear fuels. What we have is a shortage of common sense. If not for the anti-nuclear movement, we would be several generations ahead in the technology. Energy would be abundant and far cheaper. Enormous capital would have stayed in the West, rather than funding terror-supporting nations.

The roots of the opposition to nuclear energy are varied. On the one hand, there were anti-consumerist growth and population controllers like Paul R. Ehrlich. Today, with birth rates at less than replacement rates throughout much of the West, it's useful to recall his apocalyptic predictions.

An entomologist specializing in butterflies, Ehrlich gained immense fame and success with the publication of his Malthusian book *The Population Bomb* in 1968. In it, he predicted that "In the 1970s and 1980s… hundreds of millions of people are going to starve to death in spite of any crash programs embarked upon now."

In the May/June 1978 issue of Federation of American Scientists *Public Issue Report*, he wrote of nuclear power that, "Giving society cheap, abundant energy… would be the equivalent of giving an idiot child a machine gun." Remember his name, because Ehrlich plays a fascinating role in the new administration's turnaround on nuclear energy.

Then there were people like John Gofman, whom I met on several occasions at conferences. Gofman was a genial and otherwise sensible scientist with a radiation phobia. He believed even minuscule exposures to radiation had horrendous

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consequences. His theories have been repudiated as scientifically baseless, but his influence was far-reaching.

It was the coincidence of two events, though, that mainstreamed the burgeoning anti-nuclear movement. One was a minor accident at the Three Mile Island power plant in 1979, which caused no radiation injuries. The other was *The China Syndrome*, which had been in theaters for 12 days when it happened. The message of the science fiction movie was that a nuclear accident was an apocalyptic event. It was catapulted to blockbuster status and politicians quickly gave in to anti-nuclear hysteria.

Now, however, things have changed. The bugaboo du jour is carbon dioxide: supposedly, the driver behind global warming. Personally, I consider the science behind anthropogenic climate change at least as sound as Ehrlich's and Gofman's. More importantly, the U.S. cannot significantly affect global CO2 levels if the developing world does not sacrifice growth, which won't happen. What I believe, however, is irrelevant. Climate change, despite recent record-low temperatures, is a matter of faith to the Obama administration. Coal, therefore, is the new nuclear.

"Coal, therefore, is the new nuclear."

Candidate Obama told the editorial board of the *San Francisco Chronicle* that he intends to bankrupt efforts to build new coal plants. Joe Biden said the administration would oppose even new clean coal technologies. Rep. Henry Waxman, D-Calif., now chairman of the House Committee on Energy and Commerce, last year introduced the Moratorium on Uncontrolled Power Plants Act of 2008.

Obama will be forced to back off from his anti-coal fundamentalism because consumers will not tolerate higher fuel prices. Efforts will be made, though, to reduce coal consumption. Because green alternatives like wind and solar cannot power the grid any time soon, if ever, he is painted into a nuclear corner.

The Nuclear Renaissance

Today, we're experiencing what has been termed the "Nuclear Renaissance." There are two aspects to this. One is domestic. The other is international, but related to the first because U.S. politics affects the ability of American companies to export nuclear technologies and products.

Key environmentalists have switched sides, and the trend is clear. Nuclear, after all, produces no greenhouse gases. It is also ideal for producing electricity needed to power growing third-world economies as well as a "green" economy.

Whole Earth Catalog founder and environmentalist Stewart Brand may have opened the dam. Other important fans include Greenpeace co-founder Patrick Moore, who said, "I think we made the mistake early on of lumping the peaceful use of nuclear in with the warlike use of nuclear, and I've come to realize that it doesn't make sense to ban the beneficial use of technology just because that technology can be used for evil."

Green favorite and House Speaker Nancy Pelosi has made it clear which environmentalists she's listening to about nuclear power. "It has to be on the table,"

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she insists. Green organizations like the World Business Council for Sustainable Development have endorsed nuclear power. The U.K.'s independent Committee on Climate Change has also called for an acceleration of nuclear development.

Obama's choice of science adviser confirms his attitude toward nuclear energy. I've previously written about John Holdren. An environmental professor at Harvard, he started his career researching nuclear fusion and supports next-generation nuclear technology — which we'll get back to.

Now let me explain the Paul Ehrlich connection. One of Ehrlich's collaborators on his embarrassingly wrong book was Holdren. In fact, Holdren played a key role in one of the most interesting intellectual spats of that era.

Julian Simon, an economist at the University of Maryland and a friend of mine, challenged Ehrlich's claim that resources were being depleted. Ehrlich had written that "If I were a gambler, I would take even money that England will not exist in the year 2000." Simon dismissed the prediction as ridiculous, but countered in *Social Science Quarterly*. He bet $10,000 that any basket of commodities Ehrlich chose over any period greater than a year would go down in real terms.

"If I were a gambler, I would take even money that England will not exist in the year 2000."

Economists who study the history of resource markets knew that barring severe short-term disruptions, Simon would win. Ehrlich, however, made the wager. He turned to his collaborator, Holdren, who is not an economist. He picked chromium, copper, nickel, tin and tungsten. The bet took place in 1980 and extended 10 years. Ehrlich paid up in 1990.

Holdren never publicly admitted that the premises behind his predictions were wrong. He did, though, learn a painful lesson. He now expresses confidence in the ability of science to solve resource problems, particularly nuclear science. Significantly, however, he remains an adamant opponent of nuclear proliferation, which is a problem with most current nuclear technologies.

Thorium: The Fuel of the Future

So what does that leave us with? I've written about this before and will spare you some detail here, but the answer is the clearly superior fuel thorium.

Thorium is far more abundant than usable uranium. Thorium reactors produce far less waste products that are much less hazardous. In fact, that's one reason why Senate Majority Leader Harry Reid, D-Nev., is such a strong proponent of thorium nuclear power. Reid opposes the Yucca Mountain nuclear waste site in his home state and now promotes thorium as the alternative nuclear technology. On Oct. 2 of last year, he, with Sen. Orrin G. Hatch, R-Utah, introduced the Thorium Energy Independence and Security Act of 2008.

This bill, which is expected to pass, creates a thorium office at the Nuclear Regulatory Commission. Its charter is to promote domestic thorium nuclear power generation. This is critical because in the past, regulators and bureaucrats favoring old technologies and their multibillion-dollar industries hindered thorium competition. Let me quote from the statement released by the senators:

> Using thorium for nuclear power has a number of potential benefits over conventional uranium. As a resource, thorium is abundant in the U.S. and throughout the world. A thorium fuel rod would remain in the reactor about three times as long as conventional nuclear fuel, cutting the volume of spent nuclear fuel by as much as two-thirds. Also, thorium

> nuclear fuel would significantly reduce the possibility that weapons-grade material would result from the process. Finally, a thorium fuel cycle could be used to dispose of existing plutonium stockpiles, which is the national security goal.
>
> 'Our nation has focused mostly on mixed oxide nuclear fuel cycles, and our regulatory structure reflects that,' Hatch said. 'With the growing interest in thorium nuclear power in the world and in the U.S., it's time we made sure our government has a regulatory infrastructure in place to accommodate this new generation of nuclear power.'

This would have been a breakthrough for thorium power even if John McCain, R-Ariz., had been elected. An Obama presidency, however, is more auspicious. The reason, as I've written before, is that "Only Nixon could go to China." Obama and his pro-nuclear science adviser are uniquely positioned to neuter both knee-jerk partisan opposition and the environmental extremists in his own party.

"Thorium Power, of course, would earn significant revenues in the exploding global market for electricity."

Notice also one more paragraph from that Senate press release:

> [President and CEO of Thorium Power] Seth Grae said that the bill 'represents a major milestone toward the recognition that the nuclear renaissance can best be achieved by encouraging new and innovative fuels designs. Sens. Hatch and Reid have acted today to strengthen American technology and American business to compete in the global marketplace.'

So why would Reid and Hatch quote Grae in their official statement? The reason is that Grae and **Thorium Power Ltd. (THPW: OTCBB)** are pretty much the only game in town when it comes to the subject. The reason goes all the way back to the late Edward Teller, who conceived the hydrogen bomb and the "Star Wars" missile defense plan. Concerned about proliferation and terrorism, he decided a means was needed to turn extremely expensive plutonium warheads profitably into nuclear power.

To that end, he enlisted his top student and protege, Alvin Radkowsky. The most successful reactor designer of all time, the genius Radkowsky had warned for years that conventional uranium core technologies would enable nuclear terrorism.

Radkowsky designed the world's first full-scale atomic electric power plant devoted exclusively to peacetime uses. The plant, Shippingport Atomic Power Station in Pennsylvania, burned thorium fuel from 1957–1977. It was also the prototype for the table-sized reactors Radkowsky designed to power U.S. naval vessels.

At Teller's bidding, Radkowsky left semiretirement and a teaching post at Tel Aviv University to tackle the problem. He, in turn, turned to prominent anti-proliferation attorney Seth Grae. In 1992, they formed Thorium Power Inc., with Radkowsky handling the science and Grae the business. Following a merger with a publicly traded thorium mining company in 2006, the name changed to Thorium Power Ltd., but Grae remains in charge. The primary benefit of the merger, incidentally, was access to equity markets.

Beginning in 1994, Grae led a collaborative effort with Russia's prestigious Kurchatov Institute. The thorium fuel developed there has been running in a Russian reactor for nearly five years. More importantly, they formed an agreement in 2007 with Russian government-owned Red Star, one of the top nuclear design bureaus in the world. After additional testing and scale-up using Thorium Power's fuel designs, plans are to facilitate deployment within full-sized commercial reactors.

Grae expects that Russian reactors will be online within four years and deployed widely around the world. Thorium Power, of course, would earn significant revenues in

the exploding global market for electricity. According to the DOE, that market will nearly double between 2005–2030.

Thorium plans lag in the U.S., but the fastest growth will take place in the developing markets. The big short-term impact of U.S. policy changes will be to facilitate the export of proliferation-resistant technologies. Thorium, of course, has the advantage there.

Last year, in fact, Thorium Power earned its first significant revenues due to an advisory deal with the United Arab Emirates. The deal was facilitated by Bush administration efforts to provide nuclear power options that preclude enrichment and proliferation. The U.S. and the UAE officially signed a deal to cooperate in civilian nuclear energy this January.

Thorium Power has similar arrangements in the works with India. Punj Lloyd Group has signed a letter of intent to form a 50-50 joint venture partnership for the "deployment of Thorium Power's nuclear fuel designs in India, Southeast Asia and other territories; to expand consulting activities for the development of nuclear power generation regionally and worldwide; and to pursue the establishment of a joint venture between Thorium Power and Punj Lloyd to best capitalize on the emerging nuclear renaissance."

This, for me, was something of a clincher. India has an established nuclear industry and some of the world's top physicists. If it turned to Thorium Power Ltd., there's an overriding reason.

The Punj Lloyd deal, which could be finalized in March, makes perfect sense. India is rich in thorium, and there is increasing concern about uranium supplies as well as safety. Thorium Power assists with the entire range of nuclear industry and infrastructure issues. This includes reactor procurement and deployment, reactor and fuel technology, international relations and regulatory affairs.

Incidentally, I wanted to speak with CEO Seth Grae about several issues. So I called director of corporate affairs Peter Charles at company HQ in Fairfax, Va. Charles was not only helpful, but he knew Agora Financial well and told me he had just bought our founder Bill Bonner's newest book, *Mobs, Messiahs and Markets*.

When I spoke with Grae, he was in the UAE, where he can often be found. Thorium Power, in fact, has facilities there.

He told me that in the last few years, the company has bolstered its scientific team significantly. Until his death in 2002, Radkowsky headed the team. The Russian side of the science team is also impressive, as are the company's nonscience players. The most notable is Dr. Hans Blix, director general of the International Atomic Energy Agency from 1981–1997.

Clearly, this is a company loaded for bear and betting on the long run. In the meantime, Grae says the UAE's revenues are in line with the company's projected financial milestones. This is critical, as it is several years away from deploying Russian reactors based on his company's designs. He clearly believes, however, that the company is on track, as do I.

Thorium Power has a powerful patent library founded on Radkowsky's work, but now enhanced. It's not clear to me, in fact, that you could build a commercial thorium plant without the permission of the company. Its expertise and IP in nuclear fuel designs extends to thorium/uranium, thorium/reactor-grade plutonium disposing and thorium/weapons-grade plutonium disposing fuel designs for use in existing light water reactors.

THPW is the only real pure play in nuclear power today and the stars have lined up to push this company to the forefront of the rapidly growing nuclear power industry.

"Clearly, this is a company loaded for bear and betting on the long run."

Because Thorium reactors can't suffer meltdowns, they are much cheaper to build. This competitive advantage over other nuclear technologies will also significantly lower power costs.

If you're particularly cautious, you could wait until the company finalizes the deal with Punj Lloyd in March. I believe it will succeed without that deal and you could miss the first big spike. I'm adding the company to our long-run transformational portfolio now because the penny stock price is so good. Buy it and ignore it. Your children will thank you.

Recommendation: Buy Thorium Power Ltd. (THPW: OTCBB) up to $0.30. Use a limit order.

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Obama Surgeon General Pick Could Catapult Your Stem Cell Stocks

We've already discussed the impact of the Obama changes in stem cell policies. **BioTime (BTIM: OTCBB)** has announced important new stem cell lines for sale. Also, clinical testing of **Geron's (GERN: NASDAQ)** spinal cord therapy has been approved.

Now let's talk about Sanjay Gupta, who is CNN's top medical reporter. Gupta has accepted the post of surgeon general. He is opposed by some Democrats, apparently for his incisive criticisms of Michael Moore's *Sicko*, as well as failed single-payer health care systems. Confirmation, however, is expected.

This will be a huge boon to stem cell stocks.

I don't pay much attention to medical popularizers, simply for lack of time. Gupta, however, deserves attention. The reason is that the young neurosurgeon actually seems to keep up with the scientific literature. You can do that, I suppose, when you're not actually treating patients. Most people, including many physicians, are having a hard time coming to grips with the power of recent scientific breakthroughs. Gupta is not one of them.

In an interview (http://www.lef.org/magazine/mag2007/aug2007_cover_gupta_01.htm), Gupta says, "I think in the next couple of decades, we're going to get to a point of practical immortality. It's not true immortality, but practical immortality, meaning that we're going to live much longer without getting sick, and as a result, we'll have many more functional years."

The new "most promising" technology he names is "tissue engineering, with regard to stem cells." Remember, this was in 2007, before many of the most exciting and unexpected recent stem cell advances. Still, he was informed enough to say, "We're already able to use stem cells to basically improve cardiac function in someone who's had a heart attack. The reason that this is so fascinating is that this therapy can now be applied and replicated, and also because cardiac cells and brain cells can now be regenerated. Previous to this technology, it was thought that once either of these types of cells died, that was it. This is no longer the case."

I like this guy. I say that, by the way, as an adviser to one of the unsuccessful GOP presidential candidates. Gupta could really help get the word out about stem cell therapies. As the public grasps the revolutionary consequences, the companies in our portfolio that control important stem cell IP are going to take off.

Incidentally, I've been talking to the leading nonprofit policy group researching the enormous impact of imminent increases in life spans. Those impacts will not only produce huge surprises in the stock market. Think about what just a few extra decades of healthy life spans will do to real estate prices and Social Security, for example. We have

a lot to discuss.

More Moore's Law

There have been too many new developments in IT to even survey here. A few strike me as particularly interesting. The first involves medical robotics company **Stereotaxis Inc. (STXS: NASDAQ)**, which is in our portfolio.

I was pleased to see that the first clearance of a total blockage of an artery using the company's RF PowerAssert Magnetic Guidewire. The technology was cleared by the FDA last year. Using powerful external magnets to guide the tiny surgical distal tip, a hole was burned completely through a 100% occlusion in a main artery of a patient's leg. It's good to see the company continue to expand its magnetic guidance technology into new procedures.

This development was enabled by advances in chip technologies and processing power. While unblocking occlusions is clearly important, I'm also interested in the seemingly frivolous consequences of Moore's Law.

New Games Translate Brain Waves Into Computer Commands

Toy makers Mattel and Uncle Milton have both announced games that train the brain to control the movements of floating balls. A headset detects electrical brain activity. The chip then uses reinforcement software to allow users to manipulate physical objects through thought alone. Mattel's version is called Mind Flex. Uncle Milton's has a Jedi theme and is called The Force Trainer.

Far more serious applications of this technology are in development. Some benefit quadriplegics. Others are being integrated into advanced weapon control systems. I'm impressed, however, that you can now buy rudimentary versions for less than a hundred bucks.

As prices fall and other technologies benefit from accelerating IT progress, we will interface with computers in far more efficient and intuitive ways. One is simple speech, long the goal of Microsoft founder Bill Gates. We'll probably see it first, and quite soon, in use by corporations. Smart Action Co. has recently announced an advanced voice recognition system integrated with artificial intelligence. The purpose of its product is to deal intelligently and efficiently with customers via phone or video conference.

I haven't tried the system out, but I guarantee you that better versions will be forthcoming. People complain these days about tech support and sales reps outsourced to Asia. It's pretty clear that most of those jobs are going to be handled by AIs in server banks before too long.

For transformational profits,

Patrick Cox

"I think in the next couple of decades, we're going to get to a point of practical immortality."

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Portfolio Positions

as of 01/29/2009

Company	Symbol	Buy Date	Buy Price	Current Price	*Claim%	Status
Alnylam Pharmaceuticals	ALNY	1/22/08	$30.50	$22.55	-26.07%	**Buy up to $37**
Altair Nanotechnologies	ALTI	2/19/08	$3.69	$1.08	-70.73%	**Buy up to $3.75**
China Direct	CDS	3/7/08	$6.00	$1.33	-77.83%	**Buy up to $6.50**
Arrowhead Research	ARWR	4/7/08	$2.95	$0.87	-70.51%	**Buy up to $3.15**
Immersion	IMMR	6/4/08	$8.76	$5.08	-42.01%	**Buy up to $9**
Anavex Life Sciences	AVXL	6/30/08	$4.85	$2.68	-44.74%	**Buy up to $4.75**
BioTime Inc	BTIM	8/4/08	$0.75	$2.20	193.33%	**Buy up to $2**
iRobot	IRBT	9/4/08	$14.18	$8.01	-43.51%	**Buy up to $14.50**
RXi Pharmaceuticals	RXII	9/30/08	$8.50	$4.72	-44.47%	**Buy up to $8.50**
Stereotaxis	STXS	10/29/08	$4.43	$2.64	-40.41%	**Buy up to $4.50**
Geron Corp	GERN	12/2/08	$3.42	$7.34	114.62%	**Buy up to $3.75**
Medarex	MEDX	12/16/08	$4.74	$6.16	29.96%	**Buy up to $4.75**
Thorium Power	**THPW**	**1/29/09**	**NEW**	**$0.15**	**NEW**	**Buy up to 30 cents**

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