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## Critical Mass

**A point or situation at which change occurs - *Support for the measure has reached critical mass***

By Richard (Rick) Mills

As a general rule, the most successful man in life is the man who has the best information

As the world's population and standard of living continues to climb, demand for more - and cleaner energy - grows alongside the pressures we continue to put on our environment.

*"The principal motivation to reconsider the nuclear option is that nuclear power, as an alternative to fossil fuel resources, does not impair air quality and does not release greenhouse gases into the atmosphere."* John Deutch, professor MIT

Today, there is an almost global wide move to develop higher levels of nuclear energy production capacity. This is because nuclear energy works, and it's safe. There are 31 countries using nuclear energy and some of them are using this technology to produce a substantial part of their electrical needs, for example...

- France has 59 nuclear reactors and generates almost 80% of its power from nuclear power plants.
- Japan has 53 nuclear reactors and generates 65% of its electricity from nuclear power.

“Electricity generation from nuclear power is projected to increase from about 2.7 trillion kilowatt hours in 2006 to 3.8 trillion kilowatt hours in 2030.” U.S. Energy Information Administration (EIA)

The Obama administration's 2011 budget proposed tripling the loan guarantee program for nuclear power plants - from the \$18.5 billion that Congress has already approved to \$54.5 billion. Energy Secretary Steven Chu was quoted as saying this loan guarantee increase could launch 7 to 10 new nuclear power plants in the United States.

Just recently President Obama and the U.S. Department of Energy announced \$8.33 billion in loan guarantees to construct two new 1,100-megawatt nuclear reactors in Burke, Ga. - the first new US nuclear reactors in 30 years.

### **Reasons for lack of new reactors in the US:**

- The Three Mile Island reactor accident - over thirty years ago - was the most serious in U.S. history. The changes this accident caused were massive and involved everything from reactor operator training and emergency response planning to radiation protection. The U.S. Nuclear Regulatory Commission had to step up its regulatory oversight and the result has been greatly enhanced safety in the nuclear power industry.
- The movie “The China Syndrome” - about a nuclear reactor core meltdown and the resulting drama - was released less than two weeks before the accident at Three Mile Island. Not to make light of the situation but there’s no doubt the unfortunate timing coincidence of the release/accident contributed to the level of backlash against nuclear generated power
- The Chernobyl accident, in 1986, was the result of a Soviet era flawed reactor design being operated by poorly trained personnel. They had no fire procedures and no safety culture was ever established - an accident waiting to happen. This reactor would not have been licensed in the west
- Regulatory changes were implemented regarding nuclear power plants during the construction phase. Cost overruns in the billions of dollars were occurred during the 1970s and 1980s causing the abandonment of close to 100 reactor projects
- Because of better utilization and maintenance of existing US nuclear power plants nuclear power utilities were able to increase their output by 19,000 MW – the equivalent of building 17 new 1,100 MW power plants.

*“Eighteen applications have been received by the U.S. NRC for the construction of at least 25 new nuclear reactor units.”* Gregory B. Jaczko, chairman U.S. Nuclear Regulatory Commission

Today, there are some 436 nuclear power reactors operating in 31 countries and nuclear energy provides approximately 15% of the world’s electricity.

These 436 reactors - with combined capacity of over 370 Gigawatts (One GWe equals one billion watts or one thousand megawatts) - require 77,000 tonnes of uranium oxide (U3O8)

containing 65,500 tonnes of uranium (tU).

*"We believe there is not enough uranium production, either current or planned, to satisfy reactor needs, initial core requirements and inventories for new reactors."* Adam Schatzker, analyst RBC Capital Markets

According to the World Nuclear Association, about 50 power reactors are currently being constructed in 14 countries. In all there are over 130 power reactors planned and 250 more proposed.

In 2008 mining supplied roughly 70% of nuclear utility power requirements. The remaining supply deficit used to be made up from stockpiled uranium held by these very same utilities, but their stockpiles are pretty much depleted. Mine production is now primarily supplemented by ex-military material - the Megatons to Megawatts program ends in 2013.

The International Atomic Energy Agency, in its 2009 report, anticipates at least 807 GWe in new net capacity to be in place by 2030. Each GWe of increased capacity will require about 195 tU per year of extra mine production.

But consider - no one builds a \$4 to \$6-billion dollar reactor just to watch it go idle. They will order one or perhaps several years worth of fuel supply to guarantee it doesn't. And it looks like several Asian countries - China in particular - along with India, will have to start strategic stockpiles.

China currently has 11 reactors in commercial operation and there are 20 under construction with many more reactors on the drawing board. China's current nuclear power installed capacity stands at 9.1 GWe. In 2008 nuclear power contributed 1.99% of the country's total electricity output. China intends to increase its nuclear generating capacity to 160 GWe by 2030.

At the end of 2008 India had 17 nuclear power plants in operation generating 4,100 MW. India plans to expand its nuclear power generation capacity to at least 20,000 MW by 2020.

*"A gap of almost 12 trillion kilowatt hours needs to be filled by 2030.... We expect nuclear energy to play a major role in this growth."* Ian Parkinson, analyst CIBC

### **Reasons to Use Nuclear Energy:**

- Nuclear power's life-cycle emissions range from 2 to 59 gram-equivalents of carbon dioxide per kilowatt-hour. Only hydropower's range ranked lower at 2 to 48 grams of carbon dioxide-equivalents per kilowatt-hour. Wind came in at 7 to 124 grams and

solar photovoltaic at 13 to 731 grams. Emissions from natural gas fired plants ranged from 389 to 511 grams. Coal produces 790 to 1,182 grams of carbon dioxide equivalents per kilowatt hour. International Energy Agency

- Nuclear energy is reliable. Nuclear power plants do not depend on weather conditions to produce electricity nor do they need costly electricity storage options.
- One ton of uranium produces more energy than several million tons of coal and oil. Fuel transportation costs are less and there's less impact on our environment from mining.
- Nuclear power plants require very little space and can be situated close to where their power output is needed.

*"Uranium in particular stands to benefit from the nuclear renaissance, in our view, which appears to be kicking into high gear."* Bart Jaworski, analyst Raymond James

Any company being considered for investment purposes, in this sector or any other, has to meet certain criteria, they are:

- ✓ Experienced senior management
- ✓ Strong share structure
- ✓ Quality projects
- ✓ Limited Country risk
- ✓ Operating in a sector set to outperform

## **Uranerz Energy Corporation**

Ur – honor - ez

[www.uranerz.com](http://www.uranerz.com)

Uranerz Energy Corporation is listed on both the Toronto Stock Exchange and the NYSE Amex Exchange under the symbol "URZ." Uranerz is also listed on the Frankfurt Stock Exchange under the symbol "U9E".

Cash: US\$28 million

Debt: Nil

Shares Outstanding: 64,194,887

Fully Diluted: 80,029,585

Insider ownership = 10.3%

Institutional ownership = 40%

Denison Mines owns 8.5%

Retail ownership = 40%

Uranerz is included in four of the Russell Family of Indexes - the Russell 3000 Index, the Russell 2000 Index, the Russell Microcap Index and the Russell Global Index.

URZ has an experienced team of mining personnel. Many are former officers, senior management and employees of the "Uranerz Group." The Uranerz Group was the world's third-largest primary uranium producer in 1998 when it was acquired by Cameco, at that time the world's largest primary uranium producer.

Members of the Uranerz Energy management and technical team have specialized expertise in the in-situ recovery ("ISR") uranium mining method and the Company controls a large and strategic land position in the Powder River Basin of Wyoming, U.S.A. with 38 uranium projects in various stages of exploration and development - this area is well known for containing uranium mineralized sandstone-hosted "roll fronts" that are amenable to ISR mining techniques.

Wyoming leads the United States in uranium production. All of Wyoming's uranium production comes from the ISR facilities in the Powder River Basin.

In December of 2007 Uranerz submitted license and permit applications for the development of two of their projects into commercial ISR uranium mines. URZ expects these licenses to be issued mid 2010 with production beginning in 2011.

Uranerz will continue their mine permitting activities and plan to select additional properties that will be the subject of future permit applications.

Uranerz has reported NI 43-101 compliant uranium resources of 10,758,020 pounds in the Measured and Indicated category and 3,168,927 pounds in the Inferred category for five of its 38 Powder River Basin projects.

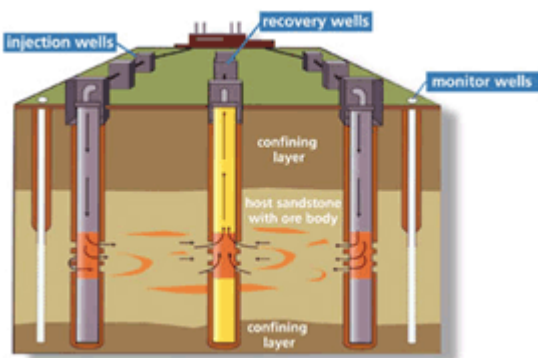
The central processing facility at the Company's Nichols Ranch ISR Uranium Project is being licensed for a capacity of 2 million pounds per year of uranium and Uranerz has signed long-term contracts for the sale of uranium with two of the United States' largest nuclear operators; Exelon who operate the largest nuclear fleet in U.S. and the third largest fleet in the world, the second contract is to one of the largest nuclear operators in the US with plants located in several states.

**Wyoming ISR advantages include:**

- Low capital costs
- Low operating costs
- Low environmental impact
- Wyoming is the largest uranium producer in the United States with a long ISR history.
- Wyoming has the largest known uranium resource base in the USA.

## ISL Mining

“In situ leaching (ISL) - also known as solution mining or in situ recovery (ISR) - involves leaving the ore in the ground, and recovering the minerals from it by dissolving them and pumping the pregnant solution to the surface where the minerals can be recovered. There is little surface disturbance and no tailings or waste rock are generated. ISR mining comprised 26% of global uranium production in 2008.” World Nuclear Association



In the USA ISR mining is seen as the most cost effective and environmentally acceptable method of mining. The first commercial ISR uranium mine in Wyoming began operations in 1974.

In the USA legislation requires that the water quality in the affected aquifer be restored after ISR mining—meaning the water must be usable for the same purposes as it was before mining began.

## Conclusion

In "Nuclear Century Outlook" the World Nuclear Association projects world nuclear generating capacity growing from a base capacity of 373 GWe today to at least 1130 GWe and possibly as high as 3500 GWe by 2060.

As mentioned the International Atomic Energy Agency anticipates at least 807 GWe in new net capacity to be in place by 2030. This would equate to mining an additional 157,365 tU per year. Yet the uranium market is, and has been, in deficit for years. Mine production is now primarily supplemented by ex-military material - the Megatons to Megawatts program ends in 2013.

*"We're increasingly convinced -- but skeptical -- that in 2013 the HEU deal will come to an end and that will remove 24 million pounds a year from the market."* Jerry Grandey, Cameco CEO

It is this author's opinion that the uranium supply is going to fall well short of demand in the near future. Is this sector on your radar screen? If it is then Uranerz Energy Corp. might be perfectly positioned to help meet a possible uranium supply shortfall and should be on every investor's watch list.

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Richard is host of [aheadoftheherd.com](http://aheadoftheherd.com) and invests in the junior resource sector. His articles have been published on over 200 websites including: Wall Street Journal, SafeHaven, Market Oracle, USAToday, National Post, Stockhouse, Casey Research, 24hgold, Vancouver Sun, SilverBearCafe, 321Gold, Kitco, Gold-Eagle, The Gold/Energy Reports, Calgary Herald and Financial Sense.

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