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## **A rare-earth gold rush**

### **The race for supremacy in green technology turns on key elements**

By Peter Koven, Financial Post

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One hybrid car requires 20 kilograms of lithium carbonate. By comparison, cellphone batteries need just a few grams. Some experts believe that as production of hybrid cars increases, so will the demand for lithium and other rare earths.

It was an investor frenzy that truly came out of nowhere. In 2009, the hottest commodities around were lithium and rare-earth metals, which were completely off the radar until that point. Even now, many investors could probably not pronounce rare-earth elements such as dysprosium and neodymium in which they have eagerly placed their money.

Lithium and rare earths got hot because of one simple fact: the emergence of new green technologies that require these metals in order to function, and specifically hybrid cars when it comes to lithium. There are no substitutes for these commodities, and investors quickly realized that the markets could become more constrained than they realized.

The result was staggering share price gains for any company involved in these spaces in 2009. For a while last summer, it looked like investors did not want to own anything else.

Of course, the frenzy eventually cooled off. And now the question is whether it was a one-time event or the start of a prolonged boom.

Experts in the industry claim it is definitely the latter, even though there are no supply shortages to speak of right now.

"For lithium, the investor frenzy cooled off a little bit, but the corporate frenzy hasn't changed at all," says Jon Hykawy, an analyst at Byron Capital Markets.

He pointed out that auto-makers, which are worried about securing supply of lithium, continue to invest in new projects. Toyota Motor Corp. recently teamed up with Australia's **Orocobre** Ltd. to develop a lithium project. In Canada, auto parts company Magna International Inc. invested in a little exploration company called Lithium Americas Corp.

Likewise, the exploration companies are working faster than ever.

"It's starting to get stupid. It's hard to find drill rigs for reasonable amounts of money in Argentina," Mr. Hykawy says. "And we're not talking complicated drilling. It's a few hundred metres."

Car companies are worried about the lithium market because supply is heavily concentrated in just four companies: SQM SA of Chile, Rockwood Holdings Inc., FMC Corp., and Talison Minerals Pty Ltd.

The lithium market is currently about 120,000 tonnes a year, more than enough to keep up with demand.

But what happens in three or four years when production of hybrid vehicles ramps up? One hybrid car will require almost 20 kilograms of lithium carbonate; by comparison, the average cellphone battery needs a few grams.

On the other hand, the rare-earth story is all about China.

Right now, the world relies almost completely on China for its rare-earth supply. The Chinese have made it clear that they want to keep more supply for themselves as they try to be the world leader in green technology.

They have placed restrictions on export, and have even invested in rare-earth companies outside China.

In one case, an attempted investment in Australian firm Lynas Corp. was blocked by regulators who are concerned about China's dominance of the sector.

"They want to capture the value-added part of the supply chain," says Don Bubar, chief executive of Torontobased Avalon Rare Metals Inc.

"But it looks like demand in China is outstripping the growth in supply as well. Hence, their interest in buying rare-metal resources in other parts of the world."

The potential shortage of rare earths is making some policymakers and green technology companies in the West very nervous. But as the Chinese have pointed out, these deposits can be found all over the world.

John Kaiser, publisher of the Bottom Fish Online report, says that China produced the rare earths so cheaply that it essentially kept other projects from going anywhere. But now they are back in business. He says there are more than a dozen companies today with serious projects, including Avalon and Quest Uranium Corp. As the market tightens and prices increase, he says these projects will be in the money and can get developed.

"What we went through last year was an awakening of the problem. And I think in the second quarter, the rare-earths stuff will go critical mass," he says.

The total rare-earth market today is around 124,000 tonnes a year. Experts say it could grow to 200,000 by 2015, but growth after that will depend on how many new green technology applications get created.

In the industry, at least, they're optimistic.

"Almost every day we get wind of some new technology that requires rare earths. Especially rare-earth magnets," Mr. Bubar says.

"They're finding their way into more and more electric-motor and generator technology. It's created more demand that has not been quantified yet."

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