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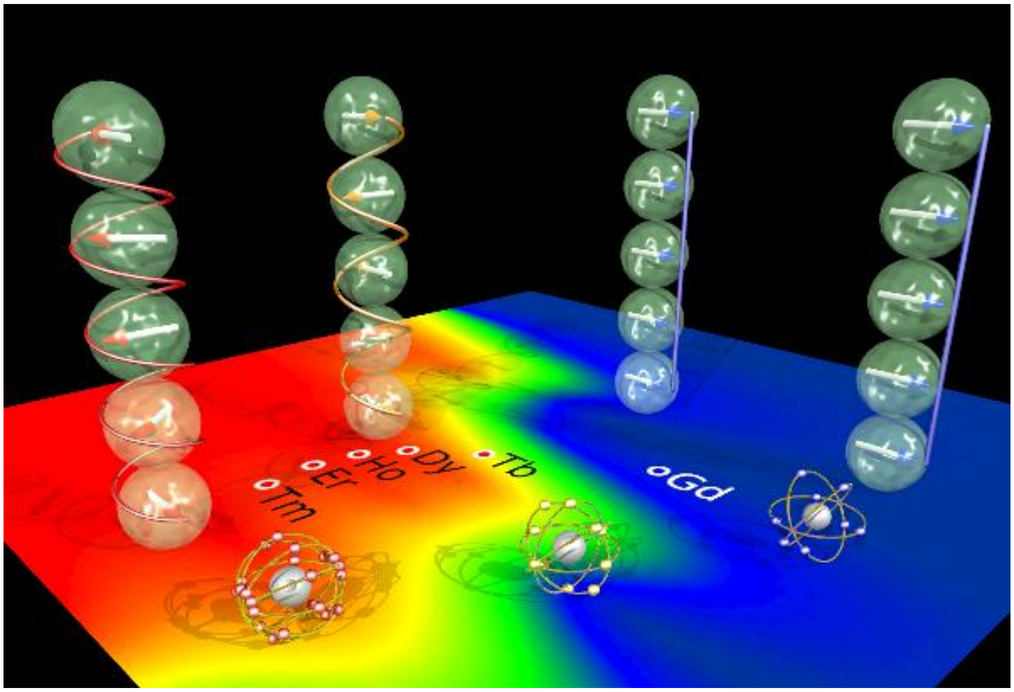
January 20, 2011

Rare Earth Elements - Industry Primer

China to the World: "You Are On Your Own"



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Investment Summary

China to the world: "you are on your own"

- In 2009 China produced over 95% of the global rare earth (RE) output. Chinese RE production has increased but exports have fallen, with the expectation that Chinese demand will continue to grow faster than the rest of the world.

- China decreased exports by 40% in 2010 and plans to cut supplies by an additional 35% in 1H2011 compared to 1H2010. As China tightens environmental regulations, it may lead to higher operating costs. More export quota cuts are expected.

- Rare earth elements declared as critical materials for the clean energy industry, and essential for US and international security.

- Most projects are four to eight years away from completion. Shortage of certain elements is imminent. Critical materials include Neodymium, Terbium, Dysprosium and Yttrium.

- First companies coming to production will be in a better position to lead the industry. Projects are capital intensive and subjected to strict environmental regulations.

- Metallurgical processing could be the "Achilles' heel" of a rare earths project. 'Chemical cracking' of individual elements in an industrial scale, is often extremely complex and expensive.

In the last few years, rare earth elements have become critical and strategic materials on the global stage. Rare earth materials are used in most of the world's current technologies, such as laptops, cell phones and MP3 players. These materials are extensively used as catalysts in oil refineries and are essential for the emerging green-technologies and the renewable energy sector. They are also critical for the defense industry and are found in various military systems, such as missiles and precision guided weapons.

Although all rare earth elements exist in a RE-bearing mineral, the separation of each element is not always economically viable.

It is now well known that rare earths are actually not that rare, but the question is not how much there is, but instead – is it economical to mine? And, how difficult and feasible would the processing and separation of the rare earth elements (REEs) be? Every RE-bearing mineral are believed to contain all the rare earth elements. However, the percentage of individual elements varies depending on the type of mineral and deposit. Thus, the grade of the rare earth oxide (REO) is important but, the percentage content of individual elements and their prices are essential in determining if a project is viable. Furthermore, although all elements are found in the mineral, not all of them (e.g. HREE in some deposits) are always economical to separate. There are many other considerations in the valuation of rare earths projects; after all we are dealing with 17 elements which are used in a variety of industries with, in some cases, completely different economic drivers. Hence, investors need to be extremely cautious when investing in this space.

In the short term however, we believe that the Chinese will maintain their export policies and motivate the rest of world to access and develop REE resources outside China. The low cost RE industry in China is no longer sustainable, and there's a critical need for the development and resurge of a global and more diversified RE industry. We strongly believe that this is the trend and that there is no way back.

There is fear that China could use its near monopoly of these critical materials for its political advantage

Some nations are even concerned that China could use its near monopoly of these critical materials for its political advantage. The United States, Europe and Japan have all been working on policies and investing in means that will guarantee a continuous supply of critical materials.

There are numerous REE projects around the world. We believe that the companies that are able to start production first, those with resources containing higher levels of elements in deficit, and those with key intellectual property, with near or fully established downstream high value production materials, will be in a better position to became leaders in this space.

Lynas Corporation owner of the Mount Weld project went through some financing issues when the markets slowed down in 2009, but is back on track and expects to initiate production in the last quarter of 2011. Molycorp Minerals has been processing REE from stockpiled ore at Mountain Pass in California since 2007, and plans to start production in 2012.

Other companies with projects expected to initiate within the next two to five years include, Rare Element Resources, Stans Energy Corp., Avalon Rare Metals Inc. and Great Western Minerals Group. Down in the supply-chain, Neo Material Technologies, an industry leader of RE-based products, is currently very active, developing agreements with different miners in various countries to secure RE supplies for its products.

Rare Earth Classification

The term "earths" is derived from the ancient Greek belief that earths were materials that could not be changed by sources of heat then available. The first rare earth was discovered in 1794 by Finish scientist Johan Gadolin, and named it Ytterbia after the village name Ytterby in Sweden where the mineral was found. The term "rare" arises from the historical difficulty in separating them as individual pure elements, but they are actually not that rare. Rare earths comprise those elements from the family of lanthanides which are found at the bottom of the periodic table with atomic numbers 57 to 61, and two other elements of similar properties, Yttrium with atomic number 21 and Scandium with atomic number 39 (Exhibit 1). The rare earths are usually sub-divided into two groups: light rare earth elements (LREE) and heavy rare earth elements (HREE). LREE includes the elements from lanthanum to gadolinium and HREE includes the elements from terbium to lutetium and Yttrium. Scandium's properties are not similar enough to group as either LREE or HREE.

Exhibit 1: Selected Properties of Rare Earth Elements

Element	Symbol	Atomic Number	Atomic Weight	Density (gcm^{-3})	Melting Point (C°)
Scandium	Sc	21	44.95	2.989	1541
Yttrium	Y	39	88.90	4.469	1522
Lanthanum	La	57	138.90	6.146	918
Cerium	Ce	58	140.11	8.160	798
Praseodymium	Pr	59	140.90	6.773	931
Neodymium	Nd	60	144.24	7.008	1021
Promethium[1]	Pm	61	145.00	7.264	1042
Samarium	Sm	62	150.36	7.520	1074
Europium	Eu	63	151.96	5.244	822
Gadolinium	Gd	64	157.25	7.901	1313
Terbium	Tb	65	158.92	8.230	1356
Dysprosium	Dy	66	162.50	8.551	1412
Holmium	Ho	67	164.93	8.795	1474
Erbium	Er	68	167.26	9.066	1529
Thulium	Tm	69	168.93	9.321	1545
Ytterbium	Yb	70	173.04	6.966	819
Lutetium	Lu	71	174.97	9.841	1663

[1]Promethium does not occur naturally as a stable isotope.
Source: BGS; JSI

Rare Earth Uses and Applications

Light Rare Earths

Lanthanum is a key component in batteries for hybrid vehicles, computers, and electronic devices. Lanthanum is utilized in hydrogen fuel storage cells, special optical glasses, electronic vacuums, carbon lighting applications, as doping agents in camera and telescope lenses, and in polishing glass and gemstones. It also has major applications in petroleum cracking, and as an alloy for many different metals.

Cerium oxide is widely used to polish glass surfaces. Other Cerium compounds are used to manufacture glass and enamels both as ingredients, as well as color removal agents. Cerium is a component in solar panels, LEDs, catalytic converters, thermal resistance alloys, carbon arc lighting, self-cleaning ovens, petroleum refining, hardening agents, and dental ceramics.

Praseodymium is a LREE with numerous applications. It is most widely used as an alloying agent with magnesium for high-strength metal applications in aircraft engines. It is also used in super magnets, catalytic converters, UV protective glasses, carbon arc lights, and CAT scan scintillators. The element is additionally used as a doping agent in fibre optic cables, and in several metal alloys.

Neodymium is essential in the production of the world's strongest super magnets, which are present in hybrid cars, state-of-the-art wind and tidal turbines, industrial motors, air conditioners, elevators, microphones, loudspeakers, computer hard drives, in-ear headphones, and guitar pick-ups. When combined with terbium, or dysprosium, a Neodymium magnet can withstand the highest temperatures of any magnet, allowing the element to be used in electric cars. Neodymium has many additional uses. It is utilized in incandescent light bulbs, cathode ray tubes, as a glass filter and colourant, as a doping agent in yttrium-aluminum-garnet lasers, and for glare-reduction in rear-view mirrors.

Samarium-cobalt alloys are used to make permanent magnets that are extremely difficult to demagnetize and work at high temperatures, making them irreplaceable in some hybrid electric automobiles. Samarium-cobalt magnets also have additional applications in the music industry, but are primarily used as precise pickups. The element can be found in many other compounds used for such products as neodymium-yttrium-aluminum garnet laser glass, and infrared absorption glass, capacitors for microwave frequencies, as well as in the cancer drug, 'Quadramet'.

Europium is used as a phosphor in all TVs and computer screens to create red and blue light, and when combined with green terbium phosphors, trichromatic fluorescent lighting is created. Europium isotopes are the best known neutron absorbers and therefore the element is ideal for control rods in nuclear reactors. The element is also used in fluorescent light bulbs, alloys, as an agent in fluorescent glass, and to dope plastic and glass to make lasers.

Gadolinium when added to chromium, iron or related alloys, greatly improves the workability and raises resistance to high temperature oxidization. It is also utilized in microwave applications, CDs, computer memory devices, MRI image enhancing, neutron radiography, and for making phosphors in TV tubes. One final use of Gadolinium comes in nuclear reactors as an emergency shut-down mechanism.

Heavy Rare Earths

Terbium is used in color TV tubes and fluorescent lamps as a green phosphor. In combination with europium blue and red phosphors, the three create trichromatic fluorescent lighting, which is much brighter than conventional fluorescent lighting. Another green application for Terbium can be found in combination with neodymium for production of the world's most heat resistant super magnets. The element is also used in alloys, crystal stabilizers in fuel cells that operate at high temperatures, specialty lasers, and to dope calcium fluoride, sodium borate and strontium molybdate materials. Terbium is a component of Terfenol-D, a material that is used in transducers, high-precision liquid fuel injectors and in a new form of audio equipment that has the potential to revolutionize the speaker industry.

Dysprosium's thermal neutron absorption cross-section and high melting point enables it to be used in nuclear control applications. The element can be added to neodymium-iron-boron magnets to raise the strength and corrosion resistance of applications like drive motors for hybrid electric vehicles. Like terbium, Dysprosium is a component of Terfenol-D; a very promising material for future technology applications. It is also used in CDs, chemical reaction testing, laser materials, and dosimeters.

Holmium has one of the highest known magnetic moments. The element is imperative in the creation of the strongest, artificially generated magnetic fields. Holmium is also used in nuclear control rods, solid-state lasers in eye-safe medical and dental microwave equipment, and as a yellow and red glass, and cubic zirconia colorant.

Erbium is used in neutron-absorbing control rods, creating lasers for cutting and welding, and as a doping agent for optical fibers. As an alloy additive, Erbium lowers the hardness and improves the workability of numerous metals. In oxide form, the element is used as a pink colorant in glass and porcelain enamel glazes, and it is often used in photographic filters.

Thulium is the second rarest element, only next to promethium, which does not occur naturally in the earth's crust. Because of its scarcity and high price, there are few widely-used Thulium applications. Its current uses are mainly scientific experimentation, and in portable x-ray devices use for areas where electric power is not available.

Ytterbium is used in solar cells, optical glasses, crystals, and ceramics. It can be utilized as a doping material for high power solid-state lasers and as an alloy that helps to strengthen stainless steel. Like thulium, Ytterbium is employed in portable x-ray machines where electricity is not available.

Lutetium is mainly used as a catalyst in refining petroleum, hydrogenation and polymerization processes, and in organic LEDs. Lutetium is currently being investigated as an agent for possible cancer treatments. It is also used in x-ray phosphors and computer memory devices.

Yttrium is most widely used in phosphors for white and grey colours in LEDs, and in tri-chromatic fluorescent lighting. Yttrium is regularly alloyed with chromium, molybdenum, zirconium, titanium, aluminum and magnesium. Yttrium is used as a deoxidizer for vanadium and other nonferrous metals, and as a catalyst in the polymerization of ethylene. It has medical applications in cancer treatment, arthritis and joint inflammation, in artificial joints, prosthetic devices, and needles. The element can also be found in optical and camera lenses, cubic zirconia jewelry, super conductor materials, high performance spark plugs, yttrium-stabilized zirconia, solid electrolytes, exhaust systems, catalytic converters, turbocharger components, and piston rings.

Source: Stans Energy Corp.

China and the Rare Earth Industry Crisis

China controls over 95% of the global rare earth oxides market. The country is fortunate to have the largest (37%) reserves in the world and own some of the most economically extractable RE resources currently known. Other countries like the United States, South Africa and Brazil were significant producers of rare earths in the past; however increasing regulations, environmental concerns and pressures from China's low cost producers changed the supply landscape of these resources, positioning China as the ultimate producer.

Chinese exports fell by almost 25% between 2005 and 2009, by 40% in 2010. In 1H2011 an additional 35% cut is expected.

As rare earth production from China continued to increase, overcapacity caused prices to collapse. In 1999, China introduced the first export quotas on rare earths. Exports fell by almost 25% between 2005 and 2009 and by 40% in 2010, compared to 2009. It has been estimated that these drastic cuts have caused an overall undersupply of rare earths in 2010. Recently the Ministry of Commerce of the People's Republic of China reported that it will decrease export quotas by 35% in the first half of 2011 compared to 1H2010, which is expected to cause further constraints in the supply of REE.

Exhibit 2: Historic Chinese Quotas (tonnes of REO)

	Chinese Export Quotas			Rest of World	Supply/Demand
	Domestic Companies	Foreign Companies	Total	Demand	Imbalance
2005	48,040	17,659	65,699	46,000	19,699
2006	45,752	16,069	61,821	50,000	11,821
2007	43,574	10,069	53,643	50,000	3,643
(1)2008	49,871	15,834	65,705	50,000	15,705
2009	33,300	16,485	49,785	25,000	24,785
2010	22,513	7,746	30,259	48,000	(17,741)
1H 2011	**10,762** compared to 16,304 for 1H2010	**3,746** compared to 5,978 for 1H2011	N/A	N/A	N/A

(1) Adjusted for Calendar year for comparative purposes

Source: Company reports; CREIC; IMOA; JSI

The country has been heavily criticized by various nations, particularly, the United States and Japan. Nonetheless, China seems determined to stay on course with further cuts and insists that they are not in violation of any World Trade Organization (WTO) rules or regulations.

China's exports cuts have been motivated by increase domestic demand, the need to create jobs and to control the environmental impact of mining REE.

China's reduction in exports have been motivated by the following reasons: 1) the need to manage their own internal demand - China is already the largest consumer of these elements; 2) to leverage its strategic supply position by expanding the downstream manufacturing industries and to create more jobs - economic studies forecast that in the next 15-20 years over 300 million Chinese will move to urban areas; and 3) to better control the environmental impact of mining and processing of these materials. REE processing and refining techniques usually involve the use of highly toxic substances, and these elements are often found together with radioactive materials such as uranium and thorium. If the mining processes are not properly handled and regulated it could lead to significant environmental complications - the point that weighs the most is debatable.

China has a serious problem with unregulated mining in the country. It has been reported that a significant number of miners operate without licenses and with little environmental concerns.

According to environmental sources, the Baotou region, which has a significant mining presence, produces 10 million tons of wastewater per year, and most is discharged into the local water systems without being treated. For instance, the Yellow River in China, from which about 150 million people depend on for primary water use, is believed to be contaminated. Public pressure and serious health concerns have moved the Chinese government to take drastic actions to regulate the mining industry. In December 2010, the Chinese Ministry of Environment Protection introduced new regulations targeting strict environmental rules, providing a three-year period for full compliance.

Exhibit 3: Rural-Urban Migration in China

30% of total Chinese exports are sold in the illegal market.

20% of total imports from Japan are believed to be from illegal sources.

Illegal REE trading is also prevalent. It has been estimated that about 30% of total Chinese exports are sold in the illegal market, with many countries benefiting from these conditions. For instance, 20% of total imports from Japan, the world's largest REE importer, are thought to be from illegal sources. In order to avoid export taxes and quotas, some smugglers mix REE with steel composites to avoid detection, which is reverse-engineered in the destination. Last year, China intensified its crackdown on smugglers, and has been giving heavy penalties to those caught. They have also implemented the unitary pricing system in many mining regions, which is expected to result in less price competition and motivate producers to follow environmental and safety rules.

China policy actions are not only meant to protect the environment but they are also aimed at generating economic growth. The global REO production industry has been estimated at about $1.5 billion; however, the industries relying on these materials are reportedly worth over $4.8 trillion.

In 2006, the Chinese Ministry of Commerce established various export taxes on rare earths that vary from 15-25% of their value, depending on the element and product. The following year, the rebate on the 16% value added tax was also withdrawn from exports of rare earth raw materials. The OECD (Organisation for Economic Co-operation and Development) calculated that the new tax changes means that non-Chinese rare earth processors pay at least 31% more for their rare earth materials than their Chinese counterparts. It has been suggested that the motivation behind these new tax rules is to compel foreign companies to consolidate supply-chains in China, creating jobs for the increasing urban population. It seems that these policies are already working.

According to the Chinese society of rare earth, China's demand for REE has grown faster than any other country. The highest demand has been for 'new materials' and high tech RE technologies, including magnets, phosphors, catalysts and batteries. In 2009 China was the largest investor in clean energy; the country has doubled its wind power capacity every year in the last five years and is now the world's largest producer of wind turbines. The country also hopes to develop its automotive industry and become the leader in electric vehicles. China has a clear green agenda and is determined to pursue it; however, Chinese officials fear that if the country's demand growth stays at this rate, it will eventually exceed current capacity, thus hindering the country's plans for industrial and economic development.

China has no intention of relinquishing the control it has in the rare earth industry. In 2005, China National Offshore Oil Corporation made a bid for Unocal, the parent of Molycorp — owner of the inactive Mountain Pass REE mine. Media frenzy erupted over concerns of energy security and the deal fell through. In 2009, China Non-Ferrous Metal Mining Co. was poised to invest $252 million for a majority stake in Lynas — an Australian mining company with an advanced stage REE exploration property — before Australia's Foreign Investment Review Board stalled the process, forcing China Non-Ferrous to back out of the deal. Chinese companies are aggressively pursuing rare earth opportunities around the globe, and the idea it seems, is to consolidate the industry into a few large players.

Governments in the developed world are devising strategies to protect their own advanced manufacturing and defense industries from a REE supply shock.

In September 2010, China's high-profile ban on REE shipments to Japan brought international concerns to the surface. With Japanese officials expressing concern about the ban undermining the nation's economy, governments in the developed world have taken notice and are now devising strategies to protect their own advanced manufacturing and defense industries from a REE supply shock.

Recently, Japan struck a deal to develop an REE mine in Vietnam solely to source materials for its automobile manufacturing industry. Similarly, US Congress recently passed legislation authorizing the US DOE to make loan guarantees to support activities from the exploration and discovery of rare earth materials through to the development of new or improved processes and technologies utilized in the industry. The legislation aims for co-operation between public and private sector participants to achieve a complete rare earth materials production capability in the United States within five years. The U.S. government's desire for vertically integrated domestic production took its first step to becoming realized when Molycorp raised $393 million in its June IPO, to fund the re-development of the Mountain Pass California REE facility.

On a global scale, as China's continues to tighten the supply of rare earths, a number of prospective mines and exploration projects have been attracting significant interest and capital across the world. Although Chinese export volumes remain a wildcard, it has become clear that supply in the near future is poised to grow, both in terms of volume and geographic diversity.

Valuation of Rare Earth Stocks

The rare earth sector is fairly new to investors, and it is experiencing a great deal of growth and volatility, driven mainly by the dramatic cuts in export quotas from China. This has led to periodic frenzies in stock prices of rare earth companies that tend to track and respond to news related to the Chinese rare earth policies. While constrains in the supply of these materials would certainly have significant effects on the price of these elements and company's stocks, there are several other factors that should be taken into consideration in a "going concern" valuation of rare earth mining companies, as listed below.

There are approximately 200 minerals that host rare earth elements, but most of the REE resources are found only in three minerals.

Mineralogy. There are approximately 200 minerals that host rare earth elements, and only about 10% of these have the potential to be economically mineable. Most of the extractable resources however, are associated with only three types of minerals: bastnäsite, monazite and xenotype. The type of mineral is very important as it ultimately determines: which elements will be extracted (mostly LREE or HREE); the extraction method — surface or underground mining; the complexity of the separation of the elements; processing costs; environmental implications; and reclamation costs and liability.

Ore Grade. The grade or concentration of an ore mineral has a direct impact on production costs. Higher grades generally mean higher percentage of elements per extracted ore volume, which normally translates into lower unit costs and better margins. The costs associated with the extraction and the processing of the RE elements (generally higher than those of major industrial metals, i.e. copper) are weighted against the value of the contained elements to determine the cut-off grade, i.e. the grade of material below which mining is not economical. High grades usually favor the success of feasibility studies. Furthermore, if the deposit has a disorderly ore quality distribution there is a simple rule of thumb that applies to cut-off grade — if the price of resources increases (decreases) in a sustainable fashion, the cut-off grade should decrease (increase). Hence, mines with higher ore grades have a better chance of staying in production when prices fall.

Companies with limited infrastructure tend to be further away from production and have higher funding needs.

Infrastructure. Projects with limited or no infrastructure generally require more funding. Infrastructure costs usually includes the costs of building roads and/or railways and airstrips, installing sources of energy and water supply, building warehouses to store raw materials, and costs associated with the development of separation and refining facilities, if not outsourced. Companies with vast infrastructure needs also tend to be further away from production, because they not only have to raise the funds which could be delayed by poor market conditions, but if the project site is in a remote location and difficult to access, it would likely limit the speed of the construction process.

Processing RE minerals is extremely complex and should have a major weight in the valuation.

Metallurgical Process. This is a major factor and should have a significant weight in the valuation. Rare earths are typically found in the company of other elements and metals, and most commonly mined as by-products, as such extractions techniques vary. Since every deposit is unique, the concentration, separation and refining processes have to be first determined and assessed for economic viability and then reproduced in a large scale. The separation and refining of rare earth elements, in particular, has always been a major challenge. Extracting gold from ore, for example, is relatively easy. Mixing the gold ore with sodium cyanide is a common method to extract the gold metal. The separation of individual RE on the other hand, is extremely complex and involves many steps because elements have similar chemical properties. Companies with production history have a significant advantage compared to those that still have to determine a processing methodology.

Environmental Impact. Rare earths are crucial for the development of green technologies but their production needs to be 'clean' to make it worthwhile. Rare earth deposits often contain radioactive materials such as uranium and thorium, and in such cases the separation process results in radioactive tailings that could be expensive to safely store and dispose of (if the radioactive materials are not commercially extractable). Mines with high concentrations of radioactive elements may have difficulty getting the necessary environmental approvals or may be subjected to heavy regulations which can cause delays. Furthermore, the refining process often involves several acid baths that also need to be safely disposed. Thus, understanding the impact of the mining activities to local and surrounding environment is extremely important.

China has shown interest in consolidating its rare earth industry, which may set a global trend.

Timing. Projects that are feasible when markets are favorable may be unfeasible when demand and metal prices are low. Commodities usually follow cycles and the possibility of a downturn should always be considered. China has shown interest in consolidating its rare earth industry, which may set a global trend, leaving small players that emerge later with limited growth possibilities.

Political climate, country risk. Projects or mines in politically unstable countries could be disrupted by war, acts of terrorism or violation and/or manipulation of contracts by local government. Politically unstable countries also tend to have highly volatile economic conditions, often with high inflation and unstable currencies. Higher discount rates are usually applied in the valuation of these companies, and macroeconomic data should be included in the forecast of the company operations.

The majority of value comes from late in the value chain, thus the ability to process high end products is a key value driver.

Vertical Integration. Firms that are capable of producing finished products could generate higher margins. The majority of value comes late in the value chain, thus the ability to process high end products is a key value driver.

End-use Market. Rare earths constitute 17 distinct elements that are used in a variety of applications; they are extensively used in the renewable energy sector and in the automotive and defense industries with mostly different economic drivers. As China cuts exports, it is believed to be affecting the supply of all 17 elements; however, as the supply side stabilizes greater attention will be paid to the demand side of the equation. Understanding which materials a company supplies and the main market for its products, is of major importance.

Significant hurdles exist for many projects; mines with strong management teams, in supportive jurisdictions with good infrastructure and resource grades will be the first to come online.

The calculation of Fair Market Value (FMV) of mining stocks varies depending on the company's development stage. Exploration companies with no defined mineral deposits present the highest challenge. There are three general approaches to determine the FMV of firms with only exploration properties: the *Geoscience Factor Method, the Appraisal Value Method and the Comparable Transaction* (or Market Approach Method). Companies with successful pre-feasibility studies would have undeveloped mineral resources and forecasts of production and cash flows, thus the Income Approach is usually preferred. Enterprise DCF can be used for the determination of the market value of producers with revenues and consistent profits.

A sound investment will include a company with an experienced management team, a project that has good infrastructure, and has achieved significant milestones, has good resources grade and material content, and an ability to fund the project development until its online date.

Mineralogy, Occurrence and Reserves

95% of the resources are found in Bastnäsite, Monazite and Xenotime minerals.

Rare earth elements do not occur naturally as metallic materials; instead they are found in a variety of minerals. REEs have been found in over 200 minerals, but only a fraction of them may have the potential to be commercially significant (Exhibit 4). Usually, every rare earth mineral contains all the rare earths, but at different concentrations (Exhibit 5). Rare earth deposits may contain more than one mineral, and they can be broadly divided into hardrock deposits (primary origin) and placer sand deposits (secondary origin). Selected rare earth deposits and mines are presented in Exhibit 6. Even though rare earth elements occur in a large number of minerals, 95% of the resources and most of the REO production is obtained from Bastnäsite, Monazite, Xenotime and ion adsorption clays (weathered REE-enriched granites).

Exhibit 4: Selected Rare Earth Minerals

Mineral	Formula	Approximate REO %
Aeschynite-(Ce)	$(Ce,Ca,Fe,Th)(Ti,Nb)_{2(}(OnOH)_{6.}$	32
Allanite-(Ce)	$(Ce,Ca,Y)_2(Al,Fe^{3+})_3(SoO_4)_3OH.$	38
Apatite	$Ca_5(PO_4)_3(F,Cl,OH)$	19
Bastnäsite-(Ce)	$(Ce,La)(CO_3)F$	75
Brannerite	$(U,Ca,Y,Ce)(Ti,Fe)_2O_6$	9
Brithlite-(Ce)	$(Ce,Ca)_5(SiO_4,PO_4)_3(OH,F)$	32
Eudialyte	$Na_4(Ca,Ce)_2(Fe^{2+},Mn,Y)$ $ZrSi_8O_{22}(OH,Cl)_2$(?).	9
Euxenite-(Y)	$(Y.Ca.Ce,U.Th)(Nb,Ta,Ti)_2O_6$	24
Fergusonite-(Ce)	$(Ce,La,Nd)NbO_4$	53
Gadolinite-(Ce)	$(Ce,La,Nd,Y)_2Fe^{2+}Be_2Si_2)_{10.}$	60
Kainosite-(Y)	$Ca(Y,Ce)_sSi_4O_{12}CO.H_2O.$	38
Loparite	$(Ce,La,Na,Ca,Sr)(Ti,Nb)O_3$	30
Monazite-(Ce)	$(Ce,La,Nd,Th)PO_4$	65
Parisite-(Ce)	$Ca(Ce,La)_2(CO_3)_3F_2.$	61
Xenotime	$YPO_4.$	61
Yttrocerite	$(Ca,Ce,Y,La)F_3.nH_2O.$	53
Huanghoite-(Ce)	$BaCe(CO_3)_2F.$	39
Cebaite-(Ce)	$Ba_3Ce_2(CO_3)_5F_2.$	32
Florencite-(Ce)	$CeAl_3(PO_4)_2(OH)_6.$	32
Synchysite-(Ce)	$Ca(Ce,LA)(CO_3)_2F.$	51
Samarskite-(Y)	$(Y,Ce,U,Fe^{3+})_3(Nb,Ta,Ti)_5O_{16.}$	24
Knopite	$(CaTi,Ce_2)O_3$	na

Source: BGS; JSI

Exhibit 5: Rare Earth Content of Major Source Minerals (in %)

Rare earths content is not the same in each mineral.

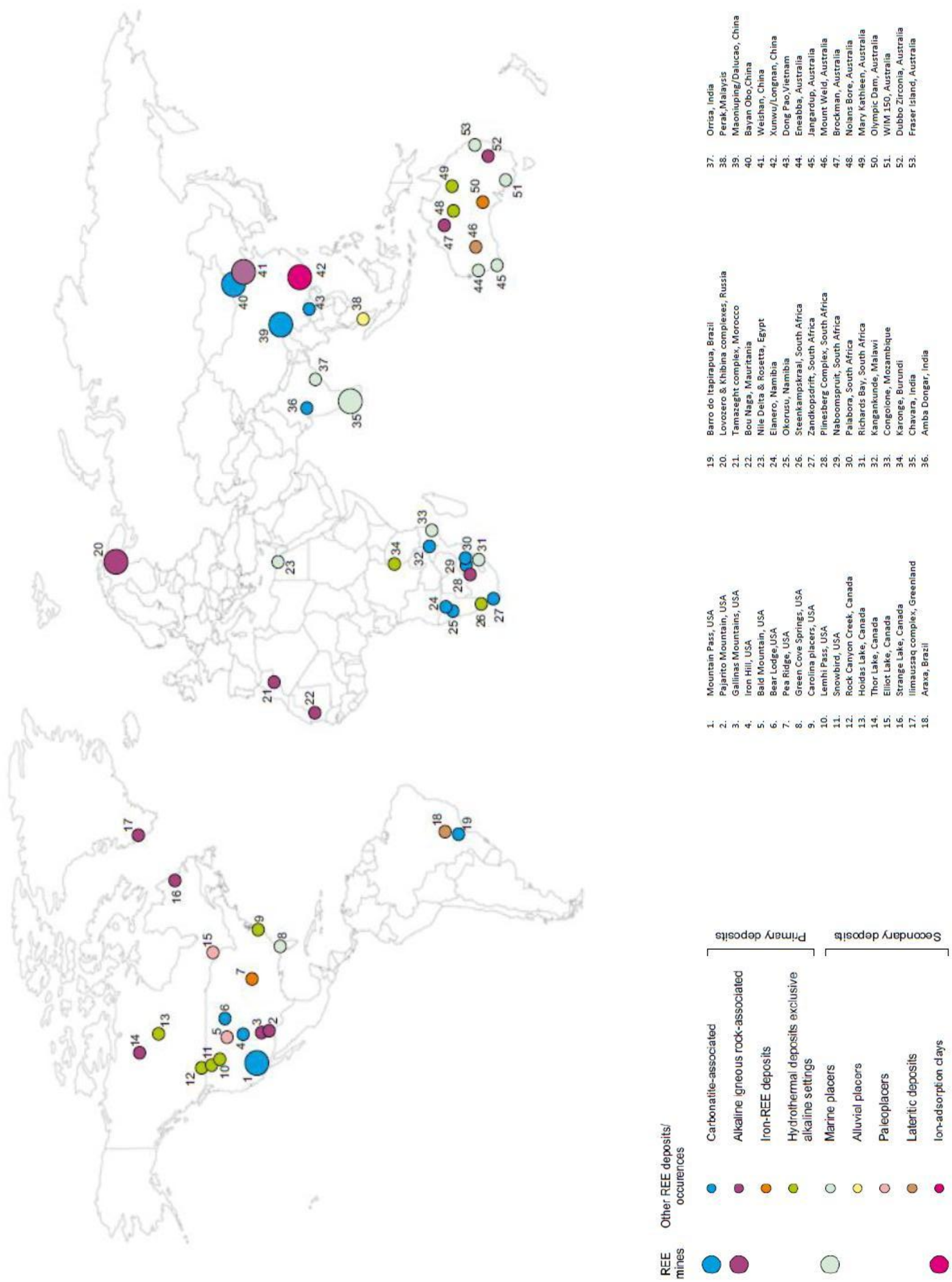
	Bastnäsite		Monazite			
Rare earth	Mountain Pass, CA, United States	Bayan Obo, Inner Mongolia, China	North Capel, Western Australia	North Stradbroke Island, Queensland, Australia	Green Cove Springs, FL, United States	Nangang, Guangdong, China
Cerium	49.10	50.00	46.00	45.80	43.70	42.70
Dysprosium	trace	0.10	0.70	0.60	0.90	0.80
Erbium	trace	trace	0.20	0.20	trace	0.30
Europium	0.10	0.20	0.05	0.80	0.16	0.10
Gadolinium	0.20	0.70	1.49	1.80	6.60	2.00
Holmium	trace	trace	0.05	0.10	0.11	0.12
Lanthanum	33.20	23.00	23.90	21.50	17.50	23.00
Lutetium	trace	trace	trace	0.01	trace	0.14
Neodymium	12.00	18.50	17.40	18.60	17.50	17.00
Praseodymium	4.34	6.20	5.00	5.30	5.00	4.10
Samarium	0.80	0.80	2.53	3.10	4.90	3.00
Terbium	trace	0.10	0.04	0.30	0.26	0.70
Thulium	trace	trace	trace	trace	trace	trace
Ytterbium	trace	trace	0.10	0.10	0.21	2.40
Yttrium	0.10	trace	2.40	2.50	3.20	2.40
Total	100.00	100.00	100.00	100.00	100.00	100.00

	Monazite—Continued		Xenotime		Ion Adsorption Clays	
Rare earth	Eastern coast, Brazil	Mount Weld, Australia	Lahat, Perak, Malaysia	Southeast Guangdong, China	Xunwu, Jiangxi Province, China	Longnan, Jiangxi Province, China
Cerium	47.00	51.00	3.13	3.00	2.40	0.40
Dysprosium	0.40	0.20	8.30	9.10	trace	6.70
Erbium	0.10	0.20	6.40	5.60	trace	4.90
Europium	0.10	0.40	trace	0.20	0.50	0.10
Gadolinium	1.00	1.00	3.50	5.00	3.00	6.90
Holmium	trace	0.10	2.00	2.60	trace	1.60
Lanthanum	24.00	26.00	1.24	1.20	43.40	1.82
Lutetium	not determined	trace	1.00	1.80	0.10	0.40
Neodymium	18.50	15.00	1.60	3.50	31.70	3.00
Praseodymium	4.50	4.00	0.50	0.60	9.00	0.70
Samarium	3.00	1.80	1.10	2.20	3.90	2.80
Terbium	0.10	0.10	0.90	1.20	trace	1.30
Thulium	trace	trace	1.10	1.30	trace	0.70
Ytterbium	0.02	0.10	6.80	6.00	0.30	2.50
Yttrium	1.40	trace	61.00	59.30	8.00	65.00
Total	100.00	100.00	100.00	100.00	100.00	100.00

Data in percentage, amounts rounded, may not add up to total.

Source: USGS; JSI

Exhibit 6: Selected Rare Earth Sites in the World



Source: BGS

Bastnäsite is the most abundant rare earth mineral; contains mostly lighter rare earth elements.

Bastnäsite (or bastnaesite) is named after the place it was first discovered, the Bastnäs mine in Sweden and is the most abundant rare earth mineral. Bastnäsite mineral is found in carbonatites associated deposits; it is typically hydrothermal but primary magmatic crystallization has also been found at Mountain Pass deposit in California. It is not commonly found as a detrital mineral (i.e. fragments or grains that have been worn away from rock.) in placers. Based on the predominant rare earth element, cerium, lanthanum or yttrium, the mineral can be represented as Bastnäsite-(Ce) with a formula of (Ce, La)CO3F, Bastnäsite-(La) with a formula of (La, Ce)CO3F, or Bastnäsite-(Y) with a formula of (Y, Ce)CO3F, with the most common being the Bastnäsite-(Ce). Bastnäsite is found in association with Allanite-(Ce), cerianite-(Ce), synchysite-(Ce), parisite-(Ce), cerite-(Ce), fluocerite-(Ce) and fluorite.

The rare earth content of bastnäsite is about 75% REO, mostly of the lighter rare earth elements (Exhibit 5), and is found in Mountain Pass California and in the large Chinese deposit in Bayan Obo. It is also found in Thor Lake in Canada, at Brockman in Australia, at Posco de Caldas in Brazil, at Karonge in Burundi, as well as Turkey, Afghanistan, Pakistan, Madagascar; Tanzania and in Zambia.

Monazite means *solitary* in Greek, as it was initially thought to be rare due to its low concentration. It is commonly found as a detrital mineral (i.e. fragments or grains that have been worn away from rock.) in placer deposits (beach and river sands). These deposits originate from a variety of primary sources and include heavy minerals rich in titanium, zirconium, tin and other metals. Monazite mineral often constitutes a small portion of these deposits and is found in the presence of radioactive elements such as uranium and most often thorium. Depending on the composition of the monazite mineral, it can be represented as monazite-(Ce) with formula (Ce, La, Pr, Nd, Th, Y)PO4, monazite-(La) with formula (La, Ce, Nd, Pr)PO4, monazite-(Nd) with formula (Nd, La, Ce, Pr)PO4 and monazite-(Pr) with formula (Pr, Nd, Ce, La)PO4. The most common element is Monazite-(Ce). Monazite is usually found in association with other minerals such as zircon, xenotime, titanite, thorite, allanite, columbite, wolframite (pegmatites and Alpine fissures), rhabdophane, cerianite, florencite and churchite.

In the long-term term demand for monazite is expected to increase, especially if thorium becomes a substitute for uranium.

In the past, producers have avoided using Monazite as an RE source because of the high levels of radioactive elements. In the long-term however, demand for monazite is expected to increase because of the mineral's abundant supply and low-cost byproduct recovery. Also, thorium has been extensively tested as a nonproliferative nuclear fuel and if consumption of thorium increases as a likely substitute for uranium, monazite could resume its role as a major source of rare earths.

Monazite typically contains 65% REO, and the rare earth fraction is constituted by significant amounts of neodymium, praseodymium and samarium, and lower contents of dysprosium, erbium and holmium. It has been found in Australia, Brazil, South Africa, China, India, United States and Malaysia.

Xenotime is a phosphate mineral, whose major component is yttrium orthophosphate (YPO4). The name xenotime means *vain* or *honor* in Greek, as yttrium was thought to be a newly discovered element. Xenotime is an accessory mineral found in a variety of igneous rocks and is associated with pegmatites; it is found in gneisses rich in mica and quartz and in Alpine veins. It is also found as a detrital mineral in placers, from where it is most currently extracted. Traces of other rare elements such as dysprosium, erbium, terbium and ytterbium are sometimes found in xenotime replacing the yttrium. It also contains traces of thorium and uranium which makes it slightly radioactive. Associated minerals include monazite, zircon, rutile, anatase, brookite, hematite, ilmenite, gadolinite, allanite, apatite, yttrotantalite and thorite.

Xenotime contains about 61% REO, with significant heavy rare earths content. An example of a detailed rare earths distribution for this mineral is presented in Exhibit 5. Xenotime occurs in placer deposits in Malaysia and in certain Australian heavy mineral sands. It has also been found in Norway, Sweden, Switzerland, Tajikistan, Madagascar, Japan, Brazil, United States and Canada.

Ion adsorption clays deposits occur throughout the southern region of China, they are often rich in HREE.

Ion adsorption clays are residual clay deposits formed from the weathering of REE-rich rocks, such as granite and carbonatite. These deposits occur throughout the southern region of China, mainly in the provinces of Jiangxi, Guandong, Hunan and Fujian. Their rare earth content varies depending on the region, but they are often rich in Yttrium and the mid rare earths Europium, Samarium and Gadolinium.

In addition to the four main mineral type deposits discussed above, there are other minerals that can become significant sources of rare earths (Exhibit 4). For instance, economic deposits of apatite mineral have been found in CIS, Australia and Canada and Loparite was the main source of rare earth for the former Soviet Union.

Reserves and Resources

Total estimated world reserves of rare earth oxides are 99 million tonnes.

According to the United States Geologic Survey (USGS), the total estimated world reserves of rare earth oxides are 99 million tonnes. The countries with the highest rare earth deposits are China with 36 million (37%), the Commonwealth Independent States with 19 million (19%), the United states with 13 million (13%), Australia with 5.4 million (6%) and India with 3.1 million (3%). Other countries have a combined 22 million tonnes of REO reserves and include India, Brazil, Canada, Greenland, South Africa, Namibia, Mauritania, Burundi, Malawi, Vietnam, Thailand and Indonesia.

Exhibit 7: Estimated World Reserves

Country	REE[1]	Yttrium
China	36,000,000	220,000
Other	22,000,000	17,000
CIS	19,000,000	72,000
United States	13,000,000	120,000
Australia	5,400,000	100,000
India	3,100,000	130,000
Brazil	48,000	2,200
Malaysia	30,000	240
World	**99,000,000**	**540,000**

[1]Data include lanthanides and yttrium but exclude most scandium.
Source: USGS

Yttrium world reserves are estimated at 540,000 tonnes. China dominates once again with 220,000 tonnes (40%), followed by the US with 120,000 tonnes (22%), Australia with 100,000 tonnes (19%) and India with 72,000 tonnes (13%). Other countries with yttrium resources include Malaysia, Sri Lanka, Brazil and Canada.

Rare earth deposits are found in various places in the world. As China loosens its dominance as the world's ultimate producer, there are a few countries that can become important rare earth producers based on their reserve quality, and several corporations have strategically positioned themselves to explore them. Exhibit 8 shows selected REE projects and their current status.

Australia, with 5.4 million tonnes of REO, has the fourth largest reserves in the world. Deposits include at least 30 monazite and two bastnäsite deposits. The Mount Weld rare earth deposit in Western Australia, owned by Lynas Corporation, ranks as one of the richest rare earth resources in the world. Total resources are estimated at 17.49 million tonnes at an average favorable grade of 8.1% REO.

Other important resources in Australia include Dubbo Zirconia owned by Alkane Resources with the project is in feasibility stage; Nolans Bore project run by Arafura Resources; the Cummins Range project owned by Navigator Resources; and the WIM 150 project run by Australian Zircon.

The United States have rare earths deposits throughout the country, and have the third largest deposit in the world. There are 32 monazite and three bastnäsite deposits in addition to several others containing other minerals. The Mountain Pass deposit was the largest known bastnäsite deposit until the Bayan Obo deposit was discovered; Molycorp plans to bring the mine back into production next year.

Another important resource is at Bear Lodge in Wyoming and is currently being explored by Rare Element Resources Ltd. In Alaska, the uranium exploration project at Bokan Mountain indicates potentially significant concentrations of light and heavy REO. Great Western Metals Group owns the Deep Sands heavy mineral sands in Utah, where surface sampling has return grades of 0.14% to 0.8% REO.

Canada has one of the seven main rare earth deposits in the world; however, the main reserves in the country are not found in the hardrock bastnäsite or in monazite placer deposits, but instead in the other least common minerals. The specialty metals deposit at Thor Lake in the Northwest Territories contains a high concentration of heavy rare earth yttrium; the project is at pre-feasibility stage and is owned by Avalon Rare Metals. Great Western Minerals Group owns the Hoidas Lake project, which has 2.8 million tonnes at an average grade of 2.43% REO. An yttrium-beryllium-zirconium deposit at Strange Lake in the Quebec-Labrador area contains large quantities of REO. Rare earths have also been reported in conjunction with uranium, in uranium deposits in Elliot Lake in Ontario.

Commonwealth of Independent States. Large deposits of the mineral loparite occur in the Kola Peninsula in Russia. Loparite deposits seem to be the main source of rare earth in that region; it has an REO content of 30% and is rich in light rare earths. Significant sources of heavy rare earth elements have been reported in Kyrgyzstan, and Stans Energy Corp. has secured a mining license to explore REE in that country. Rare earth deposits are also found in Kazahkstan, Estonia and Ukraine. The CIS region has the second largest known resources estimated at 19 million tonnes.

South America. Brazil has several beach sand deposits along the Atlantic coast as well as hard rock deposits. Rare earth reserves are estimated at 48,000 tonnes. The Araxá Carbonatite Complex reportedly contains 800,000 tonnes of the supergene-enriched laterite at an average grade of 13.5% REO. Placer deposits are mainly found in the states of Rio de Janeiro, Bahia and Espirito Santo. Other countries in South America with rare earth deposits include Argentina, Peru and Venezuela.

South and East Asia. India has a large variety of rare earth deposits of both hard rock and placer types, and has the second largest beach sand deposits in the world (after Australia). According to USGS, India has the fifth largest rare earth reserves, 3.1 million tonnes of REO and the fourth largest yttrium resources. Other countries in the region with important rare earth deposits include Malaysia, Sri Lanka and Vietnam.

Exhibit 8: Selected Projects

Deposit	Company	Project Status	Resources[1]/ Reserves[2] (Mt)	Grade (%REO)	Target Production/Date
Mountain Pass, USA	Molycorp Minerals	Separation plant re-commissioned, feasibility underway	14.1 [2]	8.2(5% cut-off)	20,000 tpa REO, 2012
Mount Weld, Australia	Lynas Corporation Ltd.	Construction phase	17.49 [1&2]	8.1(2.5% cut-off)	11,000 tpa REO, 2011
Nolans Bore, Australia	Arafura Resources Ltd.	Feasibility study	30.3 [1&2]	2.8 (1% cut-off)	20,000 tpa REO, 2013
Dubbo Zirconia, Australia	Alkane Resources Ltd.	Approvals process well advanced	73.2 [1&2]	cut-off based on zirconium grades	2,500 tpa REO, 2014
Kvanefield, Greenland	Greenland Minerals and Energy Ltd.	Pre-feasibility, Construction to begin 2013	457 [1]	1.07	43,729 tpa, 2015
Hoidas Lake, Canada	Great Western Minerals Group Ltd.	Advanced exploration	2.8 [1]	2.43 (1.5% cut-off)	5,000 tpa REO, post 2014
Bull Hill Southwest (Bear Lodge), USA	Rare Element Resources Ltd.	Advanced exploration	17.5 [1]	3.46 (1.5% cut-off)	11,400 tpa REO 2015
Kangankunde Hill, Malawi	Lynas Corporation Ltd.	Advanced exploration	2.53 [1]	4.24 (3.5% cut-off)	n/a
Nechalacho (Thor Lake - Lake Zone), Canada	Avalon Rare Metals Inc.	Pre-feasibility	204 [1]	1.45	5,000 tpa REO, post 2015
Cummins Range, Australia	Navigator Resources, Ltd.	Advanced exploration	4.17 [1&2]	1.72 (1% cut-off)	n/a
Steenkampskraal, South Africa	Rare Earth Extraction Co. Ltd. & Great Western Minerals Group Ltd.	Closed, due diligence	0.25*	17*	n/a
Strange Lake, Canada	Quest Uranium	Advanced exploration	115 [1]	1 (0.85% cut-off)	n/a
Eco Ridge, Canada	Pele Mountain Resources	Feasibility Study	n/a	n/a	n/a
Archie Lake, Canada	Quantum Rare Earth Development Corp.	Early exploration stage, recent chip sampling has returned an average grade of 3.8% REE+Y			
Deep Sands, USA	Great Western Minerals Group Ltd.	Early exploration stage, surface sampling has returned grades in the range of 0.14% to 0.8% REO			
Lofdal, Namibia	Etruscan Resources Inc.	Early exploration stage, surface sampling has returned an average grade of 0.7% REE+Y			
Yangibana, Australia	Artemis Resources	Early exploration stage, rock chip sampling has returned an average grade of 2.84% REO			
Machinga, Malawi	Globe Metals and Mining	Early exploration stage, rock chip sampling has returned a maximum value of 2.64% REO			

*Historical data

Source: Company reports; BGS; JSI

Africa. The South African Steenkampskraal Mine has possibly the highest reported grade of rare earth deposit, at about 17% REO. The project is run by Rare Earth Extraction and Great Western Mineral Group. Another important deposit in South Africa is Zandkopsdrift carbonite deposit run by Frontier Minerals. In Malawi there are two promising projects, the kangankunde deposit owned by Lynas Corporation with estimated inferred resources of 107,000 tonnes of REO, and the early stage project in Machinga owned by Globe Metals and Mining. Other countries in the region with important resources include Kenya, Madagascar, Burundi, Mauritania, Mozambique and Egypt.

China has the largest rare earth deposits in the world. The country has a variety of deposits in hard rock, placers and ion adsorption clays. The bastnäsite deposit in Bayan Obo, China's largest iron ore mine is the largest REE deposit in the world. An unusual type of deposit known as ion adsorption clays are typical from the southern region of China; this deposit contains significant resources with relatively low ore grade, yet are extremely cheap to process. More importantly, ion adsorption clays are rich in the less common heavy elements and are believed to contain approximately 80% of the world's HREE resources. China also has significant placer deposits containing monazite and xenotime at many other locations across the country.

Mining and Processing

Rare earth elements are typically a by-product of other metals. The Mountain Pass mine in California is the only known mine which operated primarily for the recovery of REE. The only other mine known to have been operated exclusively for a rare earth mineral was in Brazil, where monazite was extracted not for the REE, but instead for its high thorium content. The Mount Weld deposit in Australia, expected to start production in 2011, seems to have the potential to be operated primarily for the exploitation of rare earths.

REE are normally mined as by-products, the main metal have a significant weight in the economics of the project, and in the mining & processing plans.

China's large rare earth deposit in Bayan Obo was originally operated for the extraction of iron-ore, and REEs from placers deposits are normally by-products of titanium, zircon or tin extractions. Thus, as REEs are normally mined as by-products, the combination of principal minerals and metals present in the deposit have a significant weight in the economics of the project, and to some extent the mining plan and processing methods used. Furthermore, given the various REE-bearing type deposits, it is not surprising that REE extraction processes in the different mines around the globe often vary significantly.

Mining

Surface mining (open pit) is used to extract near surface deposits (<100 metres) and is generally cheaper and safer. This method involves removing large tonnages of waste to access the ore, digging or blasting the ore with explosives, and then transporting the ore by truck or conveyor belt for stockpiling and later processing. If the mineralization is found deep in the ground it may not be economical to remove the un-mineralized material (waste) to access the ore, as such underground mining is preferred.

Underground mining is usually three times more expensive than open pit mining.

In *underground mining* various techniques may be used depending on the type of rock. In large ore bodies mechanized systems can be applied, but in the case of narrow veins, labor intensive drilling and blasting techniques are usually used. A common mining technique is the room and pillar method in which the mined material is extracted across a horizontal plane opening multiple spaces or "rooms" underground while leaving "pillars" of untouched material to support the roof overburden. The ore is usually blasted with explosives and then transported to the surface using a railway system. Waste material is sometimes used to fill worked places helping secure the roof and improving ventilation. This technique has been used in Canadian uranium deposits where REE is recovered as a by-product.

Surface and underground mining are sometimes used simultaneously in the same mine, when ore deposits are found both close to the surface and in deeper parts of the ore body.

Bastnäsite contains hard rock deposits and may be extracted using standard surface or underground mining, or both. Currently, the best known example of bastnäsite extraction is from the large Bayan Obo deposit in China, where bastnäsite is extracted from two open pit mines. Mountain Pass deposit in California was also mined using surface techniques.

Monazite and Xenotime extraction from placer deposits sometimes requires unusual mining techniques. The method used depends on whether the deposits are on dry land or submerged in water. In dry mining applications, scrapers and bulldozers are used to remove and transport the often unconsolidated ore to the processing plant. When placer deposits are underwater or in a slurry form, floating vessels called dredgers are equipped with a series of buckets or sucking device to extract the material from the bottom of the water column. These methods usually do not require drilling and blasting, with the exception of occasional areas that have cemented sand.

Ion adsorption deposit is usually low grade but the extraction costs are lower compared to other deposit types.

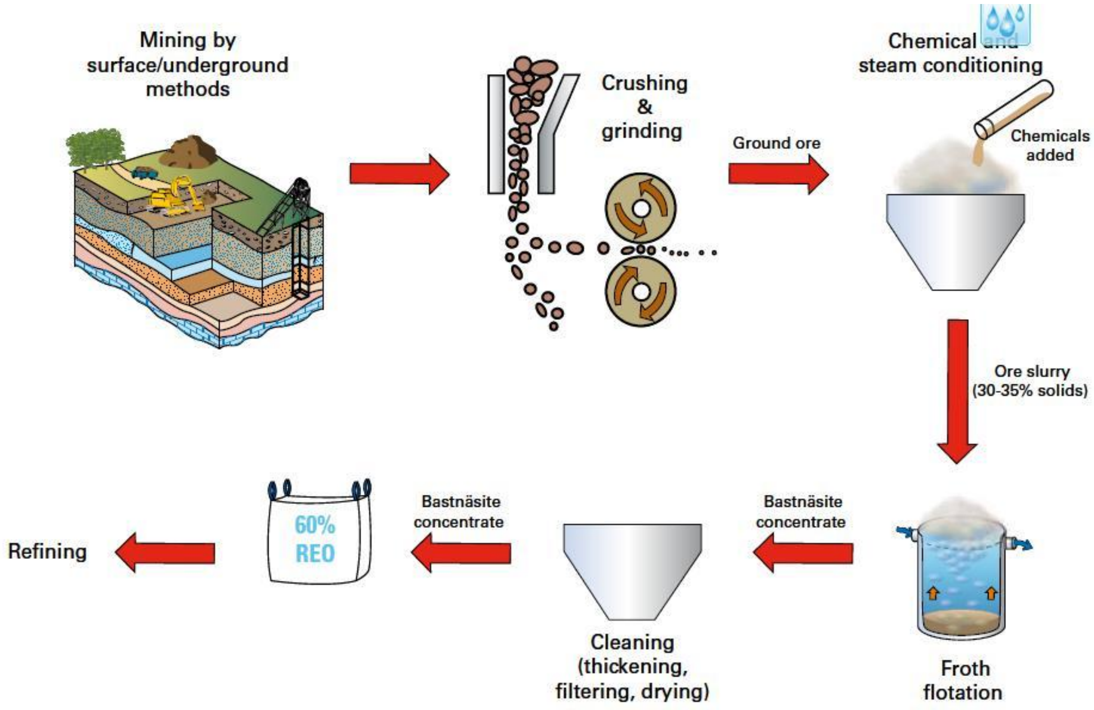
Ion adsorption deposits are mined using economic open-pit techniques; the ore is found near the surface and its unconsolidated form makes for easy mining. The deposit is usually low grade but the extraction costs are lower compared to other deposit types, as no drilling, blasting or milling is required.

Processing

After mining, the mineral material undergoes physical and chemical processing to produce highly concentrated rare earth oxides.

Bastnäsite is mined from hard rock deposits that are first crushed and screened. At Mountain Pass mine in California, the crushed ore is ground down to fine sand (~0.1mm) and then undergoes several conditioning treatments that involve different reagents and steam to produce a slurry substance with 30-35% solids. The slurry is then put through froth flotation to produce bastnäsite concentrate. Froth floatation is a process that separates materials that lack affinity with water (hydrophobic) from those with great affinity to water (hydrophilic). When the deposit contains minerals with similar floating properties the material would generally require additional separation steps. After floatation, the ore is cleaned to obtain a final concentrate of 60% REO (Exhibit 9). To achieve higher concentrations the bastnäsite concentrate is further processed chemically. The concentrate is first leached with hydrochloric acid (HCL) to remove strontium and calcium carbonates increasing the concentration up to 70%. After that, calcification is used to remove carbon dioxide, leaving an 85-90% REO concentrate.

Exhibit 9: Generalized Flow Chart of Bastnäsite Beneficiation



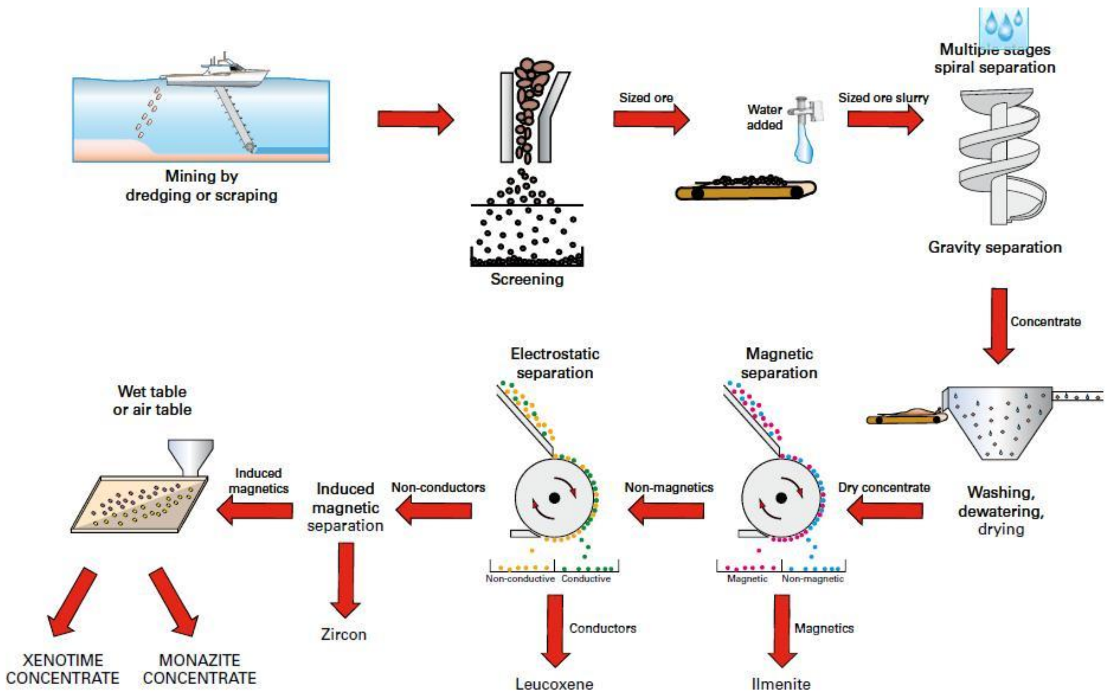
Source: BGS

At the Bayan Obo deposit, the rare earths are by-products of iron ore, and other products, e.g. megatite, flurorite, hematite niobium oxide are also extracted; as such, the processing methodology is influenced by the type of materials extracted.

Monazite and Xenotime are normally extracted from placer deposits. Again, the processing method varies greatly due to the variety of mineralogy and chemical composition of these deposits. A combination of gravity, magnetic and electrostatic methods is used in the physical beneficiation of these minerals (Exhibit 10). The concentrate is then further processed using either an acid treatment or a caustic soda method. The acid treatment has been discontinued because it resulted in large quantities of acid waste and poor product purification. The more recent caustic soda method uses a concentrate solution of sodium hydroxide that is heated at 140-150°C which converts the lanthanides and thorium to hydroxides. The process allows for phosphate recovery, which is separated by dissolving in water and recovered as crystalline trisodium phosphate.

Exhibit 10: Generalized Flow diagram for Extraction of Monazite and Xenotime

Once the concentration process is complete, the next step is to separate the individual rare earths



Source: BGS

Ion adsorption clays are relatively easy to process compared to other methods as they do not require the typical treatments used in the processing of hard rocks. The material is leached to produce a REE solution which is then precipitated to produce the REE concentrate.

Separation

Once the concentration process is complete, the next step is to separate the individual rare earths. The process is generally complex because the elements have similar properties. The mineral is usually sent to a separation plant where each element is separated using either an acid or solvent extraction process.

The ion exchange extraction method consists of the exchange of ions between an electrolyte solution and an insoluble solid. Ion exchange removes ions from the aqueous phase by the exchange of cations or anions between the contaminants and the exchange medium. This method produces an aqueous waste which contains the exchanged cautions and the REE; the individual elements are then separated using a complexing agent. This method produces small quantities of highly pure elements.

Solvent extraction, also known as liquid-liquid extraction, is a technique used to separate compounds based on their relative solubilities in two different immiscible (unmixable) liquids, usually water and an organic solvent. In an industrial setting the solvent extraction process is carried out in a group of mixer settlers. The process is repeated several times and the end results are usually RE salts or oxides. Solvent extraction is the preferred method for large scale production; however, HREEs are more difficult to extract using this method.

Most of the value comes from being able to process the concentrates and separate the individual rare earth elements. Currently, China has a firm grasp on processing capacity, but the playing field is likely to change. Lynas Corporation is close to the completion of the operating hydrometallurgical plant in Australia; Molycorp Minerals has signed an agreement to form a joint venture to produce NdFeB magnets in the US, and has a technology transfer agreement with Neo Material Technologies with respect to the production of rare earth metals, alloys and magnets; and Great Western Minerals Group already processes rare earths through two of its subsidiaries, LCM based in England and Great Western Technologies in USA. Great Western Minerals has an agreement to access 100% of the rare earths from the Steenkampskraal mine in South Africa expected to come into production in 2013. It will likely be very profitable for these companies to develop a market for concentrates and end-products outside Asia. Companies operating in early parts of the value chain will likely not be able to achieve the same value for projects as companies that are more vertically integrated (Exhibit 11).

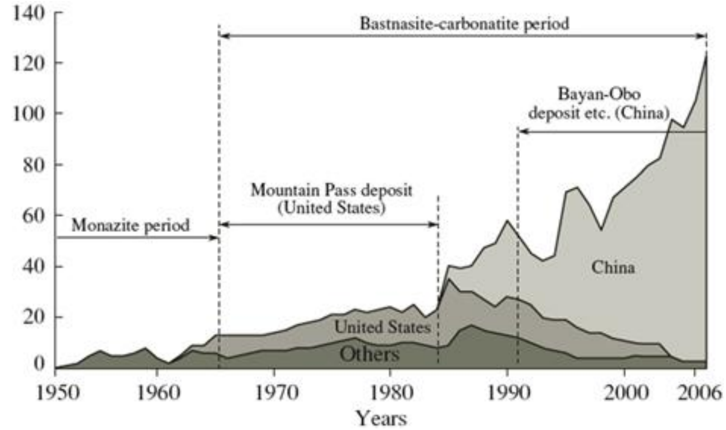
Exhibit 11: Value Chain

Source: Company Reports; JSI

World Production of Rare Earths

India and Brazil were the main producers of rare earth elements up until the late 1940s; REE was then extracted mostly from granite pegmatite deposits. In the 1950s, Australia, Malaysia and South Africa became the leaders of REE production, extracting the elements primarily from monazite in placer deposits. Between the 1960s to the 1980s the United States dominated the world's supply of rare earths, which were mostly extracted from the bastnäsite deposit in Mountain Pass, California. From 1988 onwards China has held a firm grip on the world's REE supply, led by its massive Bayan Obo deposit in Inner Mongolia (Exhibit 12).

Exhibit 12: History of Supply



Source: Russian Journal of Non Ferrous Metals; USGS

China's domination of REE production has been driven by low labor costs, lax environmental regulations and, most importantly, the Chinese government's willingness to absorb the massive capital costs associated with installing vertically integrated mining and processing infrastructure. China's low export prices has led to mine closures and scaled down production in many countries. In the United States, the Mountain Pass mine held a scaled down production up until 2002 when safety and environmental concerns forced the mine's deactivation. In the last 20 years, supportive government policies in China fuelled a production boom. Although only 37% of global REE reserves are found in China, the country currently produces most of world's rare earth oxide, with the majority accounted for by corporations with close ties to the government.

Exhibit 13: Rare Earths Estimated World Mine Production by Country

Country[1]	2004	2005	2006	2007	2008
Brazil	402	527	527	645	550
China	98,000	119,000	133,000	120,000	125,000
India	2,700	2,700	2,700	2,700	2,700
Malaysia	800	150	430	380	380
Total	**102,000**	**122,000**	**137,000**	**124,000**	**129,000**

[1]Data is rounded.
Source: USGS

According to the USGS, with the exception of China, *officially* the only other countries currently producing rare earths from local ongoing mining activities are Brazil, India and Malaysia.

In 2008 China produced 125 000 tonnes of REO, equivalent to more than 95% of the total global production. China's main producing mines are at Bayan Obo, where 50,000-65,000 tonnes of REO are produced (approximately 50% of global production). At Bayan Obo, rare earths are a by-product of iron ore; as such, the demand/supply dynamics of iron ore may affect rare earth production. In southern China, about 40,000-50,000 tonnes of REO are produced from ion adsorption clays — these deposits are the world's main source of heavy rare earths. The main rare earth companies in China are Batou Iron and Steel Group, Batou Rare Earth Group, Gansu Rare Earth Corp. and Sichuan Rare Earth Group.

India's current estimated production is 2,700 tonnes of REO, mostly from beach sand placer deposits. Main producers include India Rare Earth, which produces the HREE yttrium oxide and Kerala Minerals and Metals. Brazil's estimated production is only 550 tonnes, but the country has significant rare earth deposits that will likely be explored in the coming years. For instance, Neo Material Technologies and Mitsubishi Corp. have plans to produce REE as a by-product of tin from the Taboca Pitinga mine. Malaysia rare earth oxide production in 2008 is estimated at 330 tonnes but is expected to increase. Lynas Corp. is building a processing plant in the country and is projected to start in the third quarter of 2011.

Although no official numbers have been reported, other countries believed to be currently mining and producing REE, include Indonesia, Kazakhstan, North and South Korea, Kyrgyzstan, Mozambique, Nigeria, Russia and Vietnam.

China recently dropped export quotas significantly, with straining supply to the rest of the world

As mentioned above, in recent years China has decided to improve and restructure its rare earth industry by increasing environmental regulations, tackling illegal trading and attracting more of the downstream industry. One of significant actions in this process has been the progressive decrease in export quotas of rare earths that the technology world has been so dependent on. This has caused a dramatic increase in REE prices and, effectively, the rebirth of the rare earth mining industry outside China.

Projects under Development

Currently, there are over 100 rare earth deposits around the world; however, not all of them have the potential to be economically exploited and only a few will reach production in the next two to six years to meet growing demand. Lynas Corp. began mining the RE deposit in Mount Weld in 2007, with plans to initiate production in the third quarter of 2011. Initial production is estimated at 11,000 tonnes of REO per year; however, the company expects to expand production to 22,000 tonnes of REO per year.

Molycorp Minerals owns the Mountain Pass mine in the United States, once the world's largest mine. The company expects to initiate mining production next year and reach full production with an output of 20,000 tonnes of REO per year by 2013. Stans Energy Corporation, a Canadian-based company, owns 100% of the Kutessay II mine in Kyrgyzstan, once the main source of REE for the Soviet Union; production is projected to start in the next two-three years. Going forward, as long as Chinese policies and the economics of rare earth do not change significantly, many other projects are expected to come online. Exhibit 14 outlines selected key potential suppliers. Exhibit 15 shows the production per year for China the US and the rest of the world, and includes our 2011-2015 production forecast. Our analysis takes into account the comprehensive industrial demand forecast completed by IMCOA (Industrial Minerals Company of Australia) and the upcoming new supply of REO production.

Exhibit 14: Selected Projects

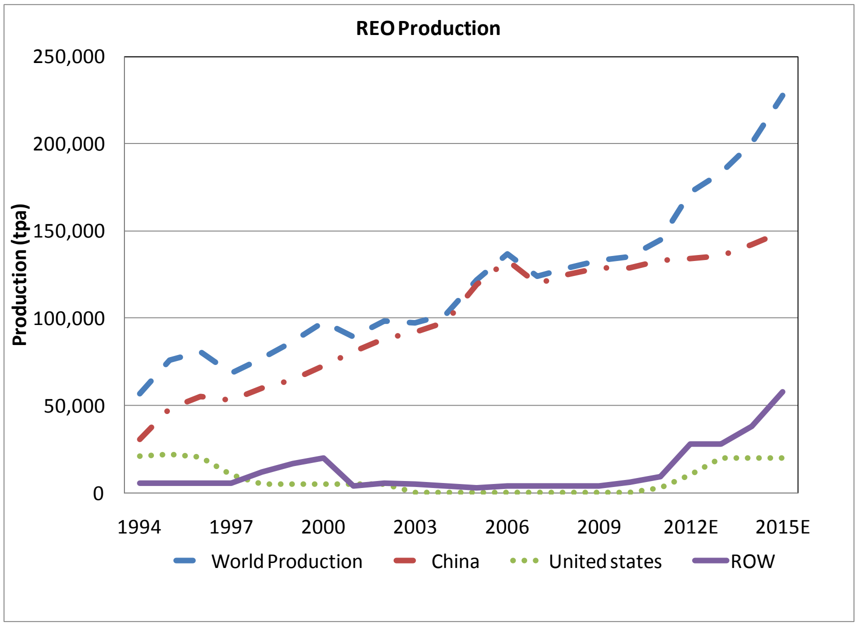
Production year	Project	Company	Project Status	Target Production (t)
2011	Mount Weld, Australia	Lynas Corporation Ltd.	Construction phase	11,000
2012	Mountain Pass, USA	Molycorp Minerals	Separation plant re-commissioned, feasibility underway	20,000
2013	Nolans Bore, Australia	Arafura Resources Ltd.	Feasibility study	20,000
2014	Dubbo Zirconia, Australia	Alkane Resources Ltd.	Approvals process well advanced	2,500
2014	Hoidas Lake, Canada	Great Western Minerals Group Ltd.	Advanced exploration	5,000
2015	Bull Hill Southwest (Bear Lodge), USA	Rare Element Resources Ltd.	Advanced exploration	11,400
2015	Nechalacho (Thor Lake - Lake Zone), Canada	Avalon Rare Metals Inc.	Pre-feasibility	5,000
2015	Kvanefield, Greenland	Greenland Minerals and Energy Ltd.	Pre-feasibility	43,729

Source: Company reports; JSI

Assuming the Molycorp and Lynas projects stay on course and both companies are able to meet their target production, we project total world production to increase by 7% in 2011 and 20% in 2012. As new mines come into production in 2012, it will likely lead to an overall surplus.

We project total world production will increase by 7% in 2011 and 20% in 2012.

Exhibit 15: Historic and Forecast Production



Source: Company reports; USGS; JSI

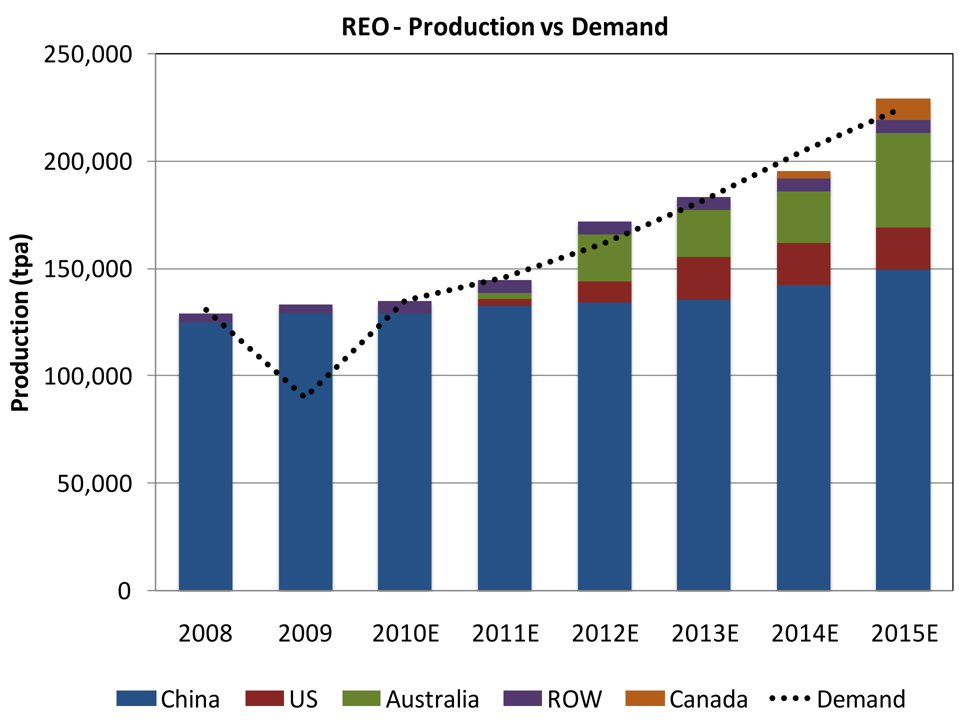
As long as current economic conditions are maintained, we estimate that non-Chinese production will reach 40,000-50,000 tonnes by 2013 or 25% of total production, reducing China's supply dominance of rare earths from about 95% to 75% in three years. In December 2010, China disclosed new regulations aimed at improving environmental conditions. According to certain economic sources, approximately 90% of the Chinese rare earth processing plants do not comply with the new regulation. We expect Chinese production growth to be modest compared to the rest of the world as the country restructures its mining industry. Thus, we forecast that China will increase production steadily to keep demand (particularly for some of the HREE) at an average rate of 3% from 2011-2013.

Exhibit 16: Estimated Production (tonnes of REO)

	2013		2015	
	Production (t/yr)	%World Production	Production (t/yr)	%World Production
United States	20,000	11%	22,000	10%
Australia	22,000	12%	40,000	18%
ROW	6,000	3%	8,000	4%
Total Non-Chinese	48,000	**26%**	70,000	**32%**
China	140,000	**74%**	150,000	**68%**
Total Production	188,000	100%	220,000	100%

Source: JSI

Exhibit 17: Estimated Production and Demand (tonnes of REO)



Source: Company Reports; IMCOA; JSI

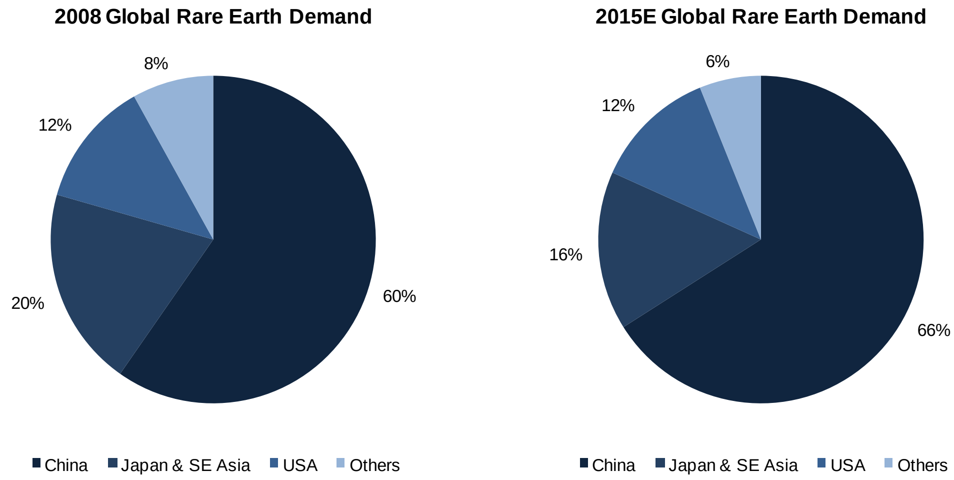
World Demand

Rare earths are used in a variety of clean-tech and high-tech applications, creating excitement around future demand.

Excitement has been generated around the use of rare earths in high-tech and clean-tech applications**.** To date, market demand for REEs has been driven by technological advances in batteries and magnets, as well as catalysts for the expanding petroleum industry. New uses in devices such as hybrid vehicles and wind turbines are continuing to drive demand, which is expected to continue to grow as these technologies become mainstream. According to IMCOA, if the global economy continues to grow (GDP 3.5-4.5% yoy), particularly with significant contribution from the emerging markets (e.g. China, India, Brazil and Russian), we should see an 8-11% increase in overall demand for rare earths.

China is expected to be the dominant consumer of rare earths, having grown from approximately 24% of the market in 2000 to 60% in 2008. China's share of the global consumption of rare earths in 2015 is expected to increase further to 66%, with Japan and South East Asia falling to 16%, and the US maintaining its share of global demand at 12%. Our 2015 production forecast indicates that China will produce about 68% of the global REO production, suggesting that China will likely become a net importer of rare earths in the next 5-10 years, particularly if domestic demand continues to grow faster than production.

Exhibit 18: Demand by Region



Source: Company Reports; IMCOA; JSI

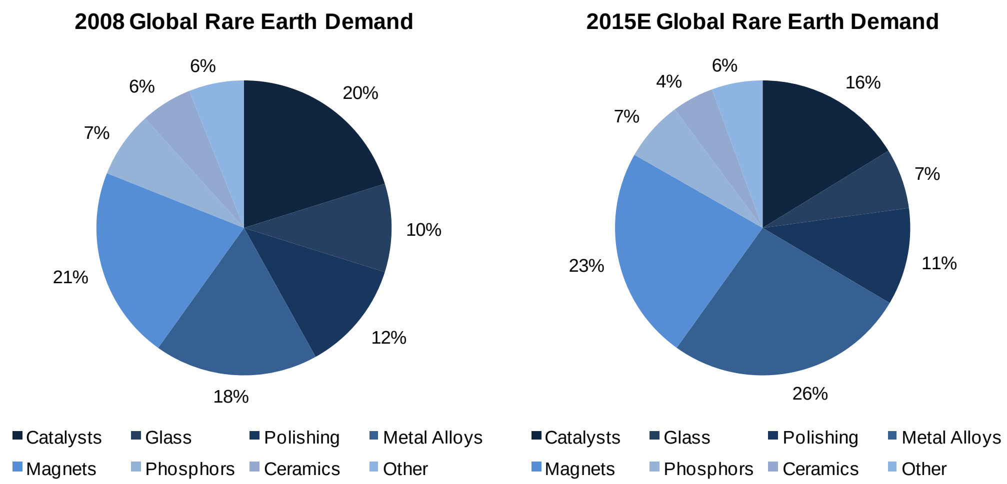
It should be noted that total rare earth production capacity in China has been estimated at more than 200,000 tonnes. However, unless the country takes dramatic steps to regulate its industry, increasing production to levels close to maximum capacity could have dramatic environmental consequences.

Consumption by End-use

The relative consumption volume of each element has changed significantly throughout the times.

Over the past few decades, rare earths have been traded in different forms. For instance, in the 1970s China used to export mostly mineral concentrates, changing to mixed REE chemicals in the 1980s and to REO in the 1990s. Currently, a significant portion of rare earths are exported as metals and products containing REE. The use of rare earth elements usually fall into one of the seven main applications: catalysts, glass, polishing, ceramics, metallurgy, magnets and phosphors (Exhibit 19-21); or other applications, such as for military systems, compounds for fertilizers and water treatments. According to IMCOA, in the next four years REE's demand growth profile for the individual sectors is expected to change, with metal alloys demand expected at 15-20% per year compared to almost no growth in REE demand for glass applications.

Exhibit 19: Demand by Application



Source : Company Reports; IMCOA

Catalysts

The growth in rare earth demand is dependent on relatively new uses for these elements, such as magnets and batteries for various applications

Catalysts accounted for 19% of REE volume share in 2008. REE is primarily used in the processing of petroleum products and automotive applications. REEs are essential for Fluid Cracking Catalysts, which are used in the refining operation of crude oil and is the major contributor to the refining process. Rare earths play a major role in the catalysts used in modern petroleum refineries. They are also essential elements in automotive catalytic converters, which transform the primary pollutants in engine exhaust gases into non-toxic compounds. REE plays a critical role in the chemical reactions within the catalytic converter and enable it to run at high temperatures. They also make them more effective and reduce the required amount of platinum and other precious metals, thus decreasing costs. Lanthanum and cerium compounds and oxides are usually used in these applications. Demand for REE for catalysts applications is expected to grow at 6-8% per year from 2011-2015.

Glass

Global consumption of REE for glass applications will see no growth in the near term.

Rare earths were first used in glass in 1896, when Cerium was used as a decolourising agent in glass. The decolourising process in glass is essential because iron oxide is always present and causes the glass to turn yellow-green. Small amounts of Cerium are useful to make colorless glass, but higher amounts can turn the glass from yellow to brown. Neodymium, praseodymium, holmium and Erbium are also used as color agents. Praseodymium is used in coatings for anti-reflective glasses and gadolinium is used in optical lenses used in magneto-optical and electro-optical systems. Global consumption of REE for glass applications are expected to stay at current levels.

Polishing

Cerium concentrate and oxide are considered the best materials for precision polishing of glass surfaces. Most of the glasses used in television faceplates, mirrors and cathode ray tubes are finished using Cerium oxide. From 2011-2015, REE demand for polishing applications is expected to grow at 6-8% per year.

Metal Alloys

REEs are used in the production of mischmetal, a pyrophoric alloy containing only rare earths. Mischmetal typical RE content is 50% cerium, 25% lanthanum with small amounts of neodymium and praseodymium. The material is most commonly used in flint ignition devises for lighters and torches, but it is first mixed with iron and magnesium oxides. It is also used as an additive for controlling inclusions in cast irons and steels. Cerium is commonly used as an additive to improve toughness in alloys. Superalloys are used in high temperature oxidizing environments such as in gas turbine engines and electric generators. Small amounts of REE in super alloys can significantly improve their oxidation properties. Yttrium, lanthanum and cerium are the most used elements in super alloys applications.

Rare earths, especially lanthanum, are used in nickel metal (NiMH) rechargeable batteries. The anode component in the NiMH battery is made of an alloy containing REEs. These batteries, as well as many other REE-bearing products, are essential in the manufacturing of hybrid cars, such as the Toyota Prius. It has been estimated that hybrid vehicles use 15-20 kg of REE.

From 2011-2015, REE demand in metallurgical applications is expected to grow at 15-20% per year, becoming the largest consuming sector for rare earths by volume (26% in 2015). Currently, hybrid vehicles make up half of the demand for NiMH batteries at approximately 57%. Most major car manufacturers plan to move to lithium ion batteries, which are projected to comprise 70% of that market by 2020. This shift in demand for NiMH batteries could negatively affect the demand for lanthanum and cerium. This example illustrates the need to understand the underpinnings of demand for these resources.

Magnets

Magnets accounted for the majority of the global REE consumption market.

Magnets accounted for the majority (37%) of the global REE consumption market in 2008. These products are expected to drive significant growth for the rare earth industry in the short term (Exhibit 19). Rare earth magnets are substantially stronger than conventional magnets such as ferrite or alnico magnets. They are used in electric motors to create mechanical energy from electrical energy through the interaction between magnetic fields and conductors that carry electrical currents. There are two types of rare earth magnets: Samarium-cobalt, which are older and less used, and Neodymium magnets, which were introduced in the 1980s and are more affordable.

Since 1990, neodymium magnets have become increasingly less expensive and applied more generally in applications such as disk drives, MP3 players and children's toys. This shift in market dynamics is driving demand for neodymium and is expected to create a shortage by 2015.

Wind turbines could represent a source of growth in demand for neodymium magnets. The alternative leads to a substantial increase in both size and weight of the head or nacelle of the wind turbine. The smaller nacelle, using the neodymium magnet allows for a taller turbine with a less substantial base. Typical 3.0MW turbines require approximately 1.0 tonne of neodymium. Offshore wind turbines, typically larger than their on-shore counterparts, represent a huge opportunity for growth. In 2008, 400 units represented 2% of the rare earth market, but this is expected to grow to 4,300 units by 2020, representing 16% of the market. China has declared its goal of more than 100GW of wind by 2020, leading the drive in renewable energy.

Phosphors

Phosphors emit luminescence when activated by photons. REEs are used in most phosphor applications, such as televisions, computer screens, cathode ray tubes, and in liquid crystal or plasma display panel technologies. Europium, yttrium, terbium and cerium are used to generate the primary colors. Rare earth phosphors are also essential components in the production of energy efficient lamps, which use only a quarter of the power needed to produce the same amount of light compared to the standard incandescent light bulb. They are also used for white LEDs which are 40% more efficient than compact florescent lamps and 80% more efficient than incandescent lighting. REEs are also used in the fabrication of glass fibers, which are capable of transmitting data over exceptionally large distances; and REE-lasers have been increasingly used for medical and cosmetic applications. Phosphors applications account for about 6% of global REE consumption by volume. In 2008, phosphors applications account for the second largest portion (31%) of global REE consumption by value (Exhibit 22), with demand expected to grow at 7-10% in the next four years.

Exhibit 20: Demand Drivers

USE	ELEMENT	INPUTS
Magnets	Nd, Pr, Sm, Tb, Dy	Computer drives, cell phones, portable music players, cameras, hybrid vehicle electric motors, cordless power tools, wind trubines, medical imaging
LaNiH Batteries	La, Ce, Pr, Nd	Hybrid vehicle batteries, hydrogen absorption alloys for rechargeable hydrogen batteries
Phosphors	Eu, Y, Tb, La, Dy, Ce, Pr, Gd	LCDs, PDPs, LEDs, Energy efficient lights/lamps/bulbs
Fluid Cracking Catalysts	La, Ce, Pr, Nd	Greater consumption for heavy oils and tar sands has driven the demand of FCCs
Polishing Powders	Ce, La, Nd	Polishing powders designed for TVs, monitors, mirrors and silicon chips
Auto Catalysts	Ce, La, Nd	Increased NO_x and SO_2 standards - input platinum is recycled, however this is not economic for rare earths
Glass Additive	Ce, La, Nd, Er	Used for digital camera lenses, and Cerium reduces UV light
Fibre Optics	Er, Y, Tb, Eu	Used to increase the signal

Source: Metal Pages; IMCOA

Ceramics

REE oxides are used to change and manage the mechanical properties of structural ceramics and their color. They are also used in ceramic capacitors to adjust their dielectric and permeability properties helping preserve the life spans of the products. Elements commonly used for ceramic applications include lanthanum, cerium, praseodymium and neodymium. Ceramic applications account for about 6% of global REE consumption; this sector is expected to grow at 6-8% in the next four years.

Looking to 2015, magnets and metal alloys, including batteries, will represent almost 50% of the demand for rare earths, while catalysts and glass are expected to decrease in market share. The overall market is expected to grow to 197,000 tonnes of REO, with all segments of demand expected to increase in absolute value.

Exhibit 21: Rare Earth Usage by Application

Application	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Y	Other
Magnets			23.4%	69.4%			2%	0.2%	5%		
Battry Alloy	50%	33.4%	3.3%	10%	3.3%						
Metallurgy ex batt	26%	52%	5.5%	16.5%							
Auto catalysts	5%	90%	2%	3%							
FCC	90%	10%									
Polishing Powder	31.5%	65%	3.5%								
Glass Additives	24%	66%	1%	3%						2%	4%
Phosphors	8.5%	11%				4.9%	1.8%	4.6%		69.2%	
Ceramics	17%	12%	6%	12%						53%	
Others	19%	39%	4%	15%	2%		1%			19%	

Source: Company Reports; JSI

Exhibit 22: Estimated Gross Value by Application

Application	Average Value	Gross Value USSM	Market Share by Value
Catalysts	US$3/kg REO	60	5%
Glass	US$2/kg REO	25	2%
Polishing	US$4/kg REO	60	4%
Metal Alloys	US$8/kg REO	175	14%
Magnets	US$18/kg REO	475	37%
Phosphors	US$45/kg REO	400	31%
Ceramics	US$7½/kg REO	50	4%
Other	US$5/kg REO	40	3%
Total	**11/kg REO avg**	**US$1200-1400M**	**100%**

Source: Company Reports; JSI

Other Applications

Rare earths are critical for the defense industry. Examples of defense technologies dependent on REE include precision guided weapons and missiles, optics equipment, sonar transducers and microwave communications, to name a few. Rare earths are also used in medical applications, for instance to improve Magnetic Resonance Imaging (MRI) equipment, an important diagnostic tool in the treatment for many diseases like cancer. Rare earths are also used in nuclear energy applications and in agriculture, as a fertilizer.

Many other rare earth applications are currently ongoing, with a great focus in the areas of energy efficiency and conservation, and environmental protection. For instance, REEs are being used in the development of magnetic refrigeration, which are more environmentally friendly and offer higher cooling efficiency; REEs are also used in fuel cell applications and in water treatment technologies. Molycorp developed a portable water treatment device that uses rare earths for the contaminant filtration process. The product can treat water contaminated with pathogens like bacteria and viruses, as well as heavy metals such as arsenic, selenium, and chromium. The technology is expected to be used in the mining and smelting industries.

Millions have been allocated for REE R&D; technological applications of these materials are expected to expand.

Most of the knowledge regarding rare earth elements has come alive in the last 100 years. Compared to other industrial metals like copper and iron, which have been extensively studied and explored, the sense is that more can be learned about these materials. Several countries around the world have developed strategic policies around the supply and R&D of rare earths and other critical materials, committing millions of dollars in education and industry development. We expect the use of rare earth elements to continue to expand.

International trade

The rare earths market is more complex than the market of other industrial metals.

The rare earths market is more complex than the market for other industrial metals; first because there are 17 materials, and they are all extracted together, at different amounts in different deposits (Exhibit 5); although it is not always economic to separate them all, especially the heavy ones when found in low concentrations. Second, they are used for different applications and industries for which demand fluctuates over time; and third, new applications for these materials can happen virtually at any time, affecting demand. REEs are in essence new specialty materials with unique natural characteristics, extensively used in research and development. When new rare earth applications are adopted, that can lead to a surge in demand and price of the underlying element or elements, sometimes to the detriment of other elements.

The historical demand for the individual rare earths has changed remarkably over the years. For instance, in the 1950s when color TV was first introduced europium was in great demand and in the 1960s demand for samarium-cobalt magnets led to an increase in demand for samarium. Today however, neither element is considered critical; instead elements such as neodymium, dysprosium and terbium are in greater demand.

In 2015 there could be a supply shortage for Praseodymium, Neodymium, Terbium, Dysprosium and Yttrium.

There are no historical records of significance on the over or under supply of rare earths. However, in recent years consumption has grown significantly, from 85,000 in 2003 to 124,000 in 2008, an increase of 45%. This may have been caused by a combination of technological developments around REE and the economic growth during that period, especially from the emerging markets such as China and India. There was a slowdown in demand for REE in 2009, likely due to the recession. However, as the global economy recovers and more emphasis is put towards green energy technologies, the accumulated demand for rare earths is expected to reach 197,000 tonnes by 2015. IMCOA analyzed the future industrial demand for individual elements and concluded that in 2015 there could be a supply shortage for Praseodymium, Neodymium, Terbium, Dysprosium and Yttrium.

Exhibit 23: 2015 Demand and Supply

	Demand	Supply	Surplus / (Shortage)
Lanthanum	55,180	60,700	5,520
Cerium	59,910	90,900	30,990
Praseodymium	15,789	10,900	(4,889)
Neodymium	44,264	36,600	(7,664)
Samarium	330	4,500	4,170
Europium	637	925	288
Gadolinium	1,264	3,400	2,136
Terbium	690	375	(315)
Dysprosium	2,300	1,950	(350)
Yttrium	16,116	12,300	(3,816)
Other	520	1,400	880
Total	**197,000**	**223,950**	**26,950**

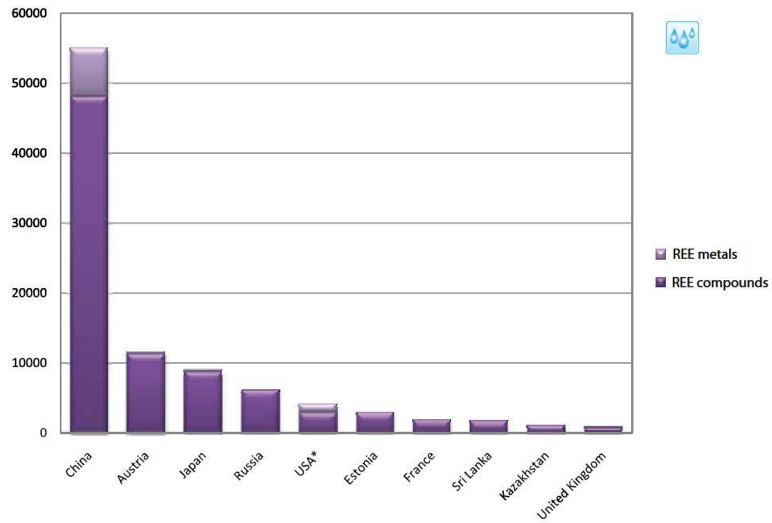
Source : Company Reports; IMCOA

Some of the heavy rare earth elements are of higher concern to consumers. At the moment, the main source for these elements is the ion adsorption clays deposit in China. As China tightens exports there are fears that these materials will become increasingly scarce. Some Canadian companies such as Stans Energy and Avalon, claim to have deposits rich in heavy rare earths, and expect to start production in the next two to four years.

As mentioned above, China is the largest exporter of rare earth products; in 2008 they exported 48,000 tonnes of rare earth compounds (or oxides). The second largest exporter was Austria which is not an REO producer. The Austrian-based company, Ireibacher AG, exports a diverse range of RE products, including mischmetal, and individual metals and alloys. The third largest exporter is Japan, followed by Russia, USA, Estonia, France, Sri Lanka, Kazakhstan and the UK. On the import side, Japan is the largest importer of REE compounds, at approximately 28,000 tonnes in 2008, followed by the US with an estimated imported volume of about 24,000 tonnes, and Germany at 11,000 tonnes.

China is the largest exporter of rare earth products, followed by Australia and Japan.

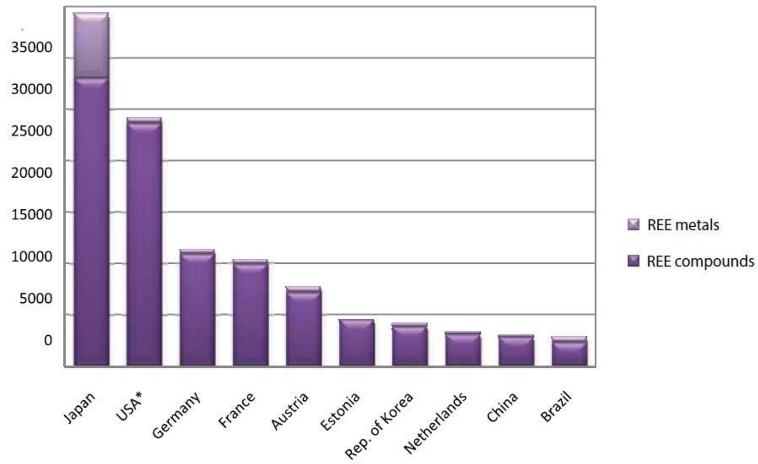
Exhibit 24: Top Exporters of REE Compounds and Metals in 2008



Source: BGS; UN ComTrade

Japan is the largest importer of REE, followed by the USA and Germany.

Exhibit 25: Top Importers of REE Compounds and Metals in 2008



Source: BGS; UN ComTrade
*2007 data.

Rare Earth Price Trends

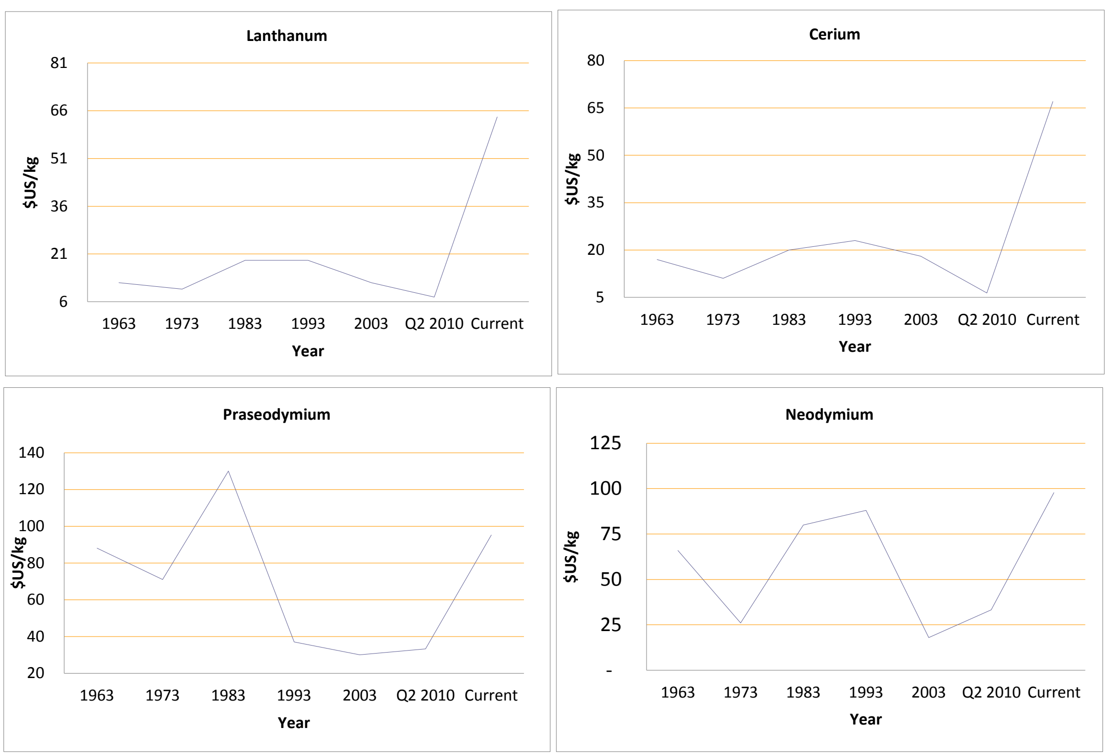
Factors that generally affect the prices of an industrial metal include, supply or production constraints, production costs (e.g. higher raw material prices), government trade policies, foreign exchange/US dollar value (as most commodities are priced in US$), strategic stockpiling, speculation and the general state of the economy. Additionally, low resources and reserve levels of an 'in demand' metal tend to drive the metal price up further. The 1980s and 1990s were bear periods for the commodities with some metals, including copper, trading below their historical real value. In the last decade however, the trend has inverted, fueled by the economic growth in the emerging markets. Most industrial metal prices are at their all-time high and for some metals there are even short-term undersupply fears (i.e. copper). Also, the 2007 recession that affected most of the industrial world slowed the growth of many of the emerging markets nations, and resulted in credit and financing constraints that led to the slowdown of mining projects around the globe. Rare earths are to some extent affected by the same factors; however, the analysis of prices over time shows that the prices of the individual rare earths do not always move concurrently. This is in sharp contrast to the price behavior of some of the major industrial metals, like copper and nickel, which are heavily influenced by overall industrial/manufacturing activities and macroeconomic conditions.

The prices of individual elements don't always follow the same trend.

Exhibits 26-28 demonstrate the price evolution of individual rare earth oxides from 1963. The data shows that prices for some of these elements were much higher than today, and that the heavy elements have always been relatively more expensive than the light rare earths. It has been suggested that the fall in the price of some elements between 1963 and 1973, was the result of large supplies from the Mountain Pass mine.

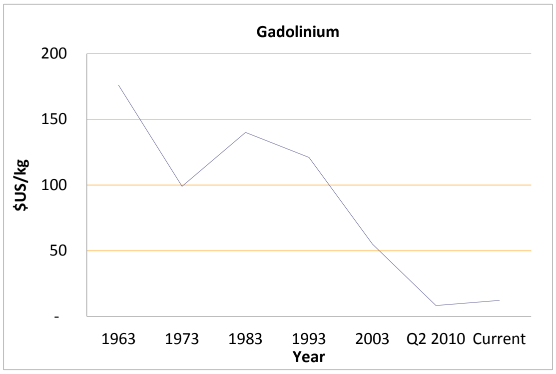
Exhibit 26: Historical Rare Earths Prices

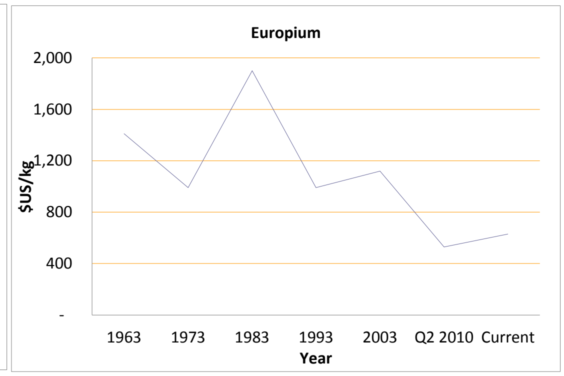
LREE Prices

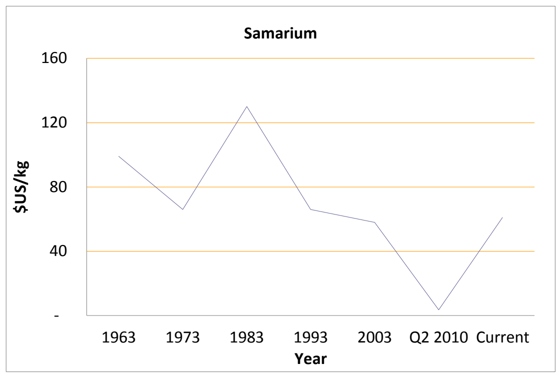


Source: Rare Element Resources; JSI

Exhibit 27: Historical Rare Earths Prices – Continuation

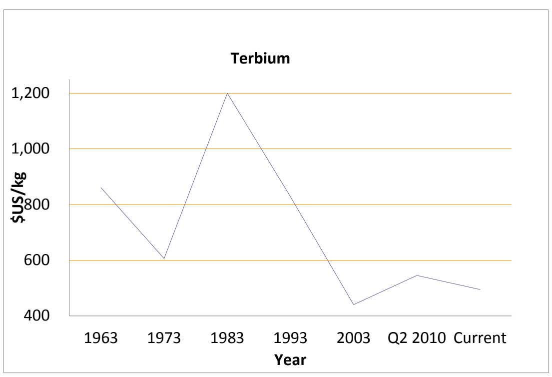


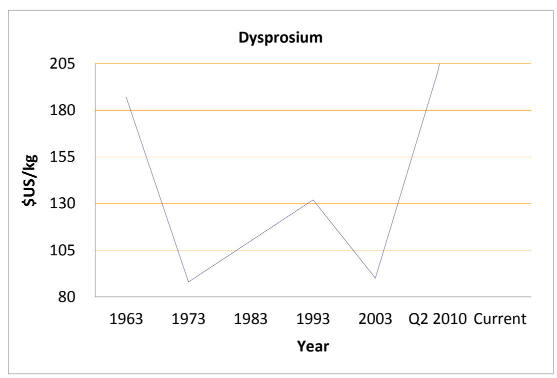


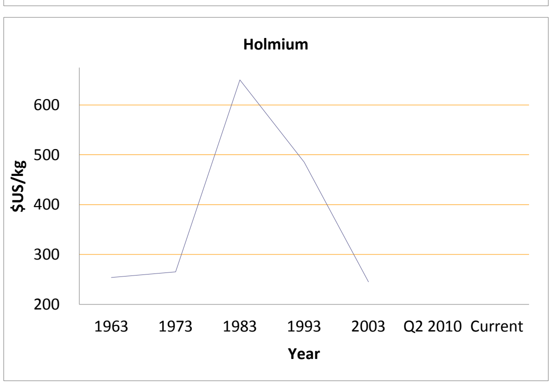


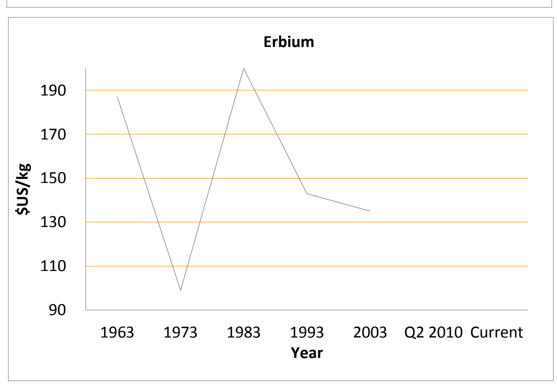
Prices of HREE have been historically higher than those of LREE.

HREE Prices



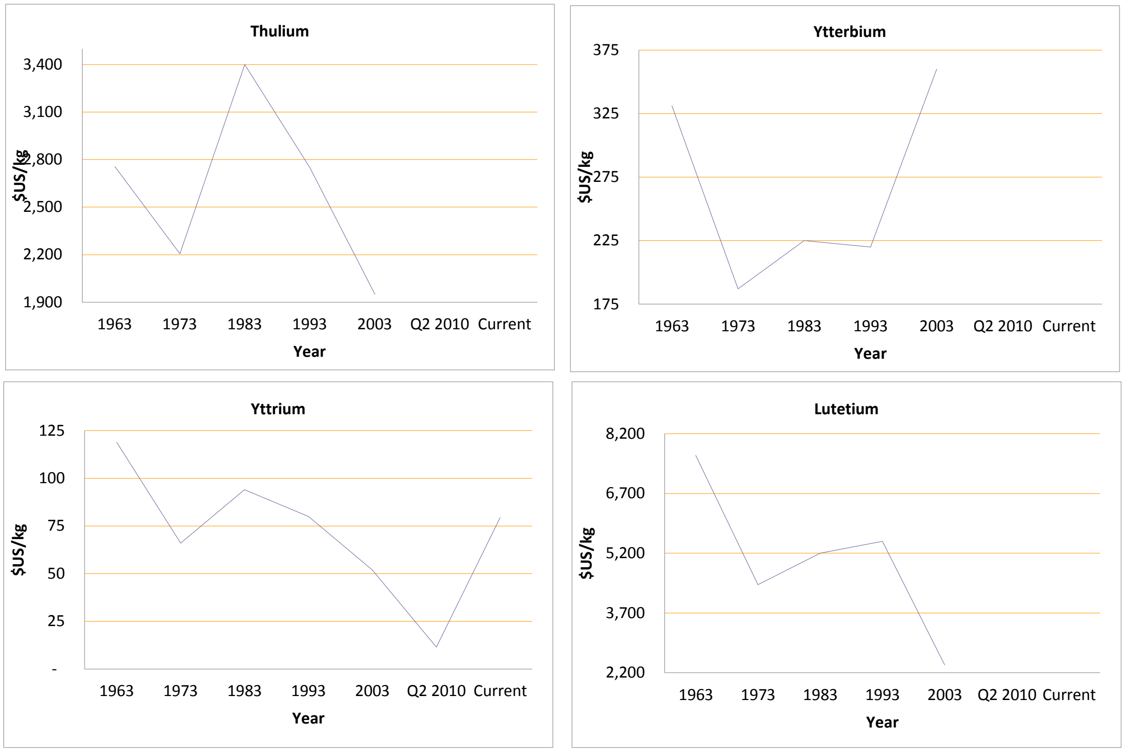






Source: Rare Element Resources; JSI

Exhibit 28: Historical Rare Earths Prices - Continuation



Source: Rare Element Resources;JSI

Prices were fairly stable in the 1980s; however, from the 1990s to the early 2000s prices were artificially low as a result of the fast growth of the rare industry in China. In 2010, due to supply constraints from China, prices for some elements have started to revert to their historical highs, with cerium and lanthanum showing the most dramatic price increase. China's Ministry of Environmental Protection recently introduced new regulations that are expected to significantly increase the costs of extracting rare earths in China. Chinese officials have indicated that the world should share the costs of extracting the rare earths and will likely attempt to raise prices to cover their expected costs to clean the environment.

Some metals are mined in conjunction with co-products or by-products that can help mitigate the costs of production. This point is of particular importance for rare earths price dynamics because a significant portion of REOs are extracted as by-products. For instance, in the Bayan Obo deposit in China, REO has been extracted as a by-product of iron, thus should demand or price conditions for iron change significantly, it could affect the supply and price of REOs and metals.

Rare earths are usually traded through bilateral contracts based on negotiated pricing between parties.

Also of importance is the manner in which commodities metals are sold — many of the major metals are traded and priced in metal exchanges (e.g. LME and NYMEX). In contrast, rare earths are usually traded through bilateral contracts based on negotiated pricing between parties. China currently supplies most of the REO market and it has been suggested that about 30% is sold in the black market. The bilateral type contracts and the existence of a large illegal trade market means that there is likely a great variability in prices and price records are incomplete.

Although strong growth in demand is a large part of the rare earth story, the recent precipitous rise in prices has been increasingly driven by the supply side. China's actions, as well as the dearth of producing mines in the rest of the world, have been the main catalysts for recent market dynamics. Exhibit 29 shows the annual prices of selected rare earths from 2007 until now; one can observe that the prices of some elements recently jumped significantly, likely influenced by the news of supply constraints from China.

Exhibit 29: Snapshot of Rare Earth Oxide Pricing

	2007	2008	2009	Q1 2010	Q2 2010	17/01/2011
Lanthanum Oxide	$3.44	$8.71	$4.88	$6.08	$7.49	$64.05
Cerium Oxide	$3.04	$4.56	$3.88	$4.46	$6.42	$67.05
Neodymium Oxide	$30.24	$31.90	$19.12	$27.56	$33.20	$97.75
Praseodymium Oxide	$29.05	$29.48	$18.03	$26.13	$33.07	$95.25
Samarium Oxide	$3.60	$5.20	$3.40	$3.40	$3.40	$61.05
Dysprosium Oxide	$89.10	$118.49	$115.67	$156.50	$200.50	$354.00
Europium Oxide	$323.90	$481.92	$492.92	$512.40	$529.80	$630.00
Terbium Oxide	$590.40	$720.77	$361.67	$478.90	$538.50	$635.00

Note: Average annual prices for a ‘standard` 99% purity of individual elements and for the generic composite of rare earth distribution.

Source: Lynas Corporation, Pele Mountain Resources; JSI

With new production set to come online between late 2011 and 2015, absolute supply should keep up with demand for most years, during that period. The caveat to this is that there is an imbalance in supply and demand of specific elements (exhibit 23). Certain elements may not be in large enough supply to meet demand, such as neodymium. These imbalances are likely to create continued upward pressure on pricing.

Exhibits 30 and 31 present a comparative analysis of estimated blended oxide prices for selected companies against market prices, data includes average market blended oxides prices from 2008 to 2009, and current market prices.

Competitive Landscape

Exhibit 30: Comparable Companies

Ticker	TSX:AVL	TSXV:RES	ASX:LYC	ASX:ARU	TSXV:GWG	NYSE:MCP	TSXV:QRM	TSXV:RUU	TSXV:UCU	TSXV:HUD
Company Name	Avalon Rare Metals Inc.	Rare Element Resources Ltd.	Lynas Corp. Ltd.	Arafura Resources Limited	Great Western Minerals Group, Ltd.	Molycorp, Inc.	Quest Rare Minerals Ltd.	Stans Energy Corp.	Ucore Rare Metals Inc.	Hudson Resources Inc.
Primary Project	Thor Lake	Bear Lodge	Mt. Weld	Nolans Bore	Hoidas Lake/Rareco	Mountain Pass	Strange Lake	Kutessay II	Bokan-Dotson Ridge	Sarfartoq
Geography	Northwest Territories	Wyoming	Western Australia	Northern Territory, AUS	Saskatchewan	California	Quebec	Krygyzstan	Alaska	Greenland
Share Price										
Current [(1)]	**$5.79**	**$13.64**	**$1.95**	**$1.50**	**$0.60**	**$46.13**	**$5.82**	**$1.71**	**$0.87**	**$1.74**
52 Week Low	*$1.89*	*$1.94*	*$0.38*	*$0.38*	*$0.15*	*$12.10*	*$1.74*	*$0.19*	*$0.20*	*$0.46*
52 Week High	*$8.14*	*$17.85*	*$2.35*	*$1.79*	*$0.70*	*$62.80*	*$6.23*	*$1.84*	*$1.03*	*$1.86*
Diluted Market Cap	$567.2	$538.4	$3,254.8	$550.3	$221.9	$3,801.5	$357.8	$239.4	$98.4	$106.9
Adjusted Market Cap [(2)]	**$529.2**	**$528.0**	**$2,872.8**	**$530.3**	**$222.2**	**$3,451.1**	**$354.8**	**$237.7**	**$95.8**	**$103.1**
Total Resource[(3)] (t MM)	**204.0**	**17.5**	**17.5**	**30.3**	**2.9**	**14.1**	**114.0**	**N/A**	**N/A**	**14.1**
% Measured	*0.0%*	*0.0%*	*41.2%*	*0.0%*	*33.8%*	*100.0%*	*0.0%*	*N/A*	*0.0%*	*0.0%*
% Measured & Indicated	*10.5%*	*0.0%*	*71.5%*	*100.0%*	*89.9%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Grade (TREO%)	1.4%	3.5%	8.1%	2.6%	2.4%	8.2%	1.0%	0.3%	N/A	N/A
HREO (% of TREO)	*19.8%*	*3.4%*	*6.9%*	*3.1%*	*7.5%*	*0.5%*	*38.6%*	*44.2%*	*50.0%*	*N/A*
Contained TREO (t MM)	2.917	0.606	1.417	0.788	0.068	1.154	1.140	0.063	0.165	0.213
Blended Oxide Price [(4)] ($/kg)	$17.95	$12.57	$14.01	$12.07	$10.47	$8.91	$19.07	$36.69	$24.86	N/A
Contained Resource Value (US$ MM)	$52,374	$7,609	$19,846	$9,508	$716	$10,279	$21,740	$2,312	$4,103	N/A
Adj. Market Cap / Contained TREO ($/t)	$181	$872	$2,028	$673	$3,249	$2,991	$311	$3,772	$581	N/A
Adj. Market Cap / Contained Resource Value	1.08%	7.08%	16.40%	5.79%	30.99%	36.98%	1.65%	10.36%	2.40%	N/A
NI 43-101 (or Equivalent) Compliant Resource	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**
Stage of Production	**Feasibility**	**Scoping Study**	**Construction**	**Metallurgy**	**Metallurgy**	**Production/ Expansion**	**Scoping Study**	**Discovery Delineation**	**Discovery Delineation**	**Exploration**

Source: SEDAR Filings, Company Press Releases, Corporate Presentations, Company Websites

(1) Current as of Close on January 17, 2011

(2) Market Cap plus debt less working capital. Converted to C$ at exchange rate as of January 17, 2011

(3) Includes Measured, Indicated and Inferred Resources (or Proved and Probable where applicable)

(4) Based on REO Distribution, using average oxide pricing from 2008-2009, sourced from Metal-Pages.com

(5) Average Comparable REO Distribution used as where distribution not yet available

Exhibit 31: Selected Companies Oxides Distribution and Pricing Comparison

	Oxide	Symbol	2008-2009 Avg Price (US$/kg) (5)	TSXV:RES (6)	ASX:LYC (7)	ASX:ARU (8)	TSXV:AVL (9)	TSXV:GWG (10)	TSXV:MCP (11)	TSXV:QRM (12)	TSXV:RUU (13)	TSXV:UCU (14)
Light	Lanthanum	La	**$6.8**	29.3%	24.0%	19.7%	15.8%	21.7%	48.8%	13.2%	9.4%	0.5%
Light	Cerium	Ce	**$4.3**	45.9%	43.0%	47.5%	35.7%	46.7%	34.0%	27.4%	25.9%	1.0%
Light	Praseodymium	Pr	**$20.9**	4.4%	4.9%	5.8%	4.5%	5.0%	4.2%	3.0%	3.3%	0.4%
Light	Neodymium	Nd	**$20.9**	14.4%	17.5%	21.2%	17.8%	16.7%	11.7%	10.7%	8.8%	0.6%
Light	Samarium	Sm	**$4.5**	2.4%	2.5%	2.4%	3.9%	2.5%	0.8%	2.6%	3.9%	0.7%
Heavy	Europium	Eu	**$470.0**	0.6%	0.7%	0.4%	0.5%	0.1%	0.1%	0.2%	2.6%	0.2%
Heavy	Gadolinium	Gd	**$8.1**	1.2%	1.7%	1.0%	3.7%	1.7%	0.2%	2.7%	2.8%	3.1%
Heavy	Terbium	Tb	**$500.0**	0.2%	0.2%	0.1%	0.5%	0.1%	0.0%	0.6%	1.2%	0.7%
Heavy	Dysprosium	Dy	**$107.5**	0.5%	0.7%	0.3%	2.7%	0.7%	0.1%	4.1%	6.5%	7.0%
Heavy	Yttrium	Y	**$14.4**	0.9%	3.5%	1.3%	11.7%	5.0%	0.1%	28.1%	27.6%	84.0%
	Blended Oxide Price (US$/kg) - 2008-2009 Avg			**$12.57**	**$14.01**	**$12.07**	**$17.95**	**$10.47**	**$8.91**	**$19.07**	**$36.69**	**$24.86**
	NI 43-101 (or Equivalent) Compliant			*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*No*	*No*

	Oxide	Symbol	Current Avg Price (US$/kg) (5)	TSXV:RES (6)	ASX:LYC (7)	ASX:ARU (8)	TSXV:AVL (9)	TSXV:GWG (10)	TSXV:MCP (11)	TSXV:QRM (12)	TSXV:RUU (13)	TSXV:UCU (14)
Light	Lanthanum	La	**$64.1**	29.3%	24.0%	19.7%	15.8%	21.7%	48.8%	13.2%	9.4%	0.5%
Light	Cerium	Ce	**$67.1**	45.9%	43.0%	47.5%	35.7%	46.7%	34.0%	27.4%	25.9%	1.0%
Light	Praseodymium	Pr	**$95.3**	4.4%	4.9%	5.8%	4.5%	5.0%	4.2%	3.0%	3.3%	0.4%
Light	Neodymium	Nd	**$97.8**	14.4%	17.5%	21.2%	17.8%	16.7%	11.7%	10.7%	8.8%	0.6%
Light	Samarium	Sm	**$61.1**	2.4%	2.5%	2.4%	3.9%	2.5%	0.8%	2.6%	3.9%	0.7%
Heavy	Europium	Eu	**$630.0**	0.6%	0.7%	0.4%	0.5%	0.1%	0.1%	0.2%	2.6%	0.2%
Heavy	Gadolinium	Gd	**$12.4**	1.2%	1.7%	1.0%	3.7%	1.7%	0.2%	2.7%	2.8%	3.1%
Heavy	Terbium	Tb	**$635.0**	0.2%	0.2%	0.1%	0.5%	0.1%	0.0%	0.6%	1.2%	0.7%
Heavy	Dysprosium	Dy	**$354.0**	0.5%	0.7%	0.3%	2.7%	0.7%	0.1%	4.1%	6.5%	7.0%
Heavy	Yttrium	Y	**$14.4**	0.9%	3.5%	1.3%	11.7%	5.0%	0.1%	28.1%	27.6%	84.0%
	Blended (Light) Oxide Price (US$/kg) - Current			**$69.40**	**$68.41**	**$72.38**	**$60.01**	**$67.75**	**$69.97**	**$45.07**	**$40.81**	**$2.40**
	[1]**Blended (Heavy) Oxide Price (US$/kg) - Current**			**$7.05**	**$8.80**	**$4.52**	**$18.91**	**$4.31**	**$1.28**	**$25.87**	**$55.59**	**$43.49**
	Blended Oxide Price (US$/kg) - Current			**$76.45**	**$77.21**	**$76.90**	**$78.92**	**$72.06**	**$71.25**	**$70.94**	**$96.40**	**$45.88**
	NI 43-101 (or Equivalent) Compliant			*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*No*	*No*

[1] Heavy rare earths may not be economic to process if found in small percentages

Pricing Comparison: Scoping Study estimates vs. Current Market

Figures in US$/kg	NYSE:MCP	TSXV:RES	TSX:AVL	TSXV:GWG	TSXV:QRM	TSXV:RUU
Estimated Blended Oxide Price (US$/kg) - Current	**$71.25**	**$76.45**	**$78.92**	**$72.06**	**$70.94**	$96.40
Blended Oxide Market Price - Current	$70.00	$70.00	$70.00	$70.00	$70.00	$70.00
[16]**Premium** / *Standard* ***Oxide***	*2%*	*9%*	**13%**	*3%*	*1%*	**38%**

(5) Based on REO Distribution, using average oxide pricing from 2008-2009.
(6) Rare Elements Resources Press Release
(7) Lynas Corp Press Release
(8) Arafura Resources Press Release
(9) Avalon Rare Metals Corporate Presentation
(10) NI 43-101 Technical Report (SEDAR)
(11) Molycorp Prospectus (EDGAR)
(12) NI 43-101 Technical Report (SEDAR)
(13) Historical Ore Distribution. Source: Company Website
(14) Based on Preliminary Results from 2 Exploration Wells. Source: Company Website
(15) Based on Metals Pricing (FOB China) as of September 21, 2010 - sourced from Metal-Pages.com
(16) Blended Oxide Price above 10% market price defined as Premium

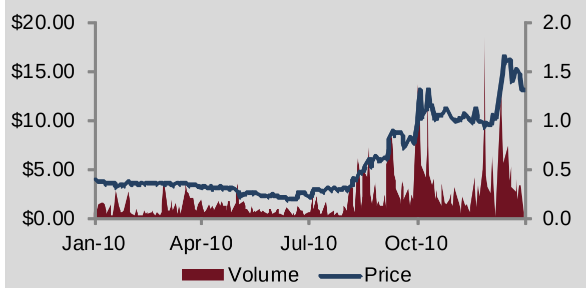
Rare Element Resources

Rare Element Resources Ltd. engages in the acquisition, exploration, and development of mineral properties primarily in Canada and the United States. The company primarily focuses on gold and rare-earth elements. It holds a 100% interest in the Bear Lodge property located in northeast Wyoming. The company was incorporated in 1999 and is based in Vancouver, Canada.

- Owns the Bear Lodge property, which contains significant high-grade REE in carbonatite dikes as well as gold mineralization. One of the largest deposits of disseminated rare earth elements in North America.
- NI 43-101 inferred mineral resource estimate reports two REE deposits containing 17.5 million tonnes averaging 3.46% REO (@1.5% cut-off). At a 4% REO cutoff grade the deposits contain 4.4 million tonnes averaging 6.65% REO. The total estimated contained REO is 1.21 billion lbs. The elements in higher proportion are cerium, lanthanum and neodymium.
- Preliminary metallurgical testing of the oxide material is encouraging with 90% recovery and a grade of 13% REO or more.
- Well-developed surrounding infrastructure.
- Project status: advanced exploration. Production projected to start in 2015, with 11,400 tonnes of TREO per year.

Ticker	TSXV:RES
Date	January 20, 2011
Share Price	$13.17
52 Week High	$17.85
52 Week Low	$1.94
Shares Outstanding	35.0
Market Cap	$461.1
Net Debt	(11.5)
Cash & Short Term Investments	$11.5
Debt	$0.0
Total Enterprise Value	$449.6

Price/Volume Chart



Project Details

Name	Bear Lodge
Location	Crook County, Wyoming, US
Stage of Production	Metallurgical Testing
Size of Property	971 ha
Type of Ore	Carbonatite and alkaline
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	3.46% REO @ 1.5% Cutoff Grade
Resource's Principal REEs	45.0% Ce, 29.3% La, 16.8% Ne, 4.8% Pr
Average Grade of Other Principal By-products	n/a
Off take agreement	n/a
Target Production (year)	2015
Target Production (tonnage)	11,400 TREO tonnes per year
Resource	
Measured	n/a
Indicated	n/a
Inferred	17.5Mt @ 3.46% REO
Ownership	100%

Lynas Corporation Limited

Lynas Corporation Limited, together with its subsidiaries, engages in the exploration and development of rare earths deposits, and other mineral resources in Australia and Asia. The company focuses on the development of the Mt Weld Rare Earths project located south of Laverton in Western Australia; and the Crown Polymetallic Project, which includes niobium, tantalum, zirconium, titanium, and rare earths deposits. It is also involved in the planning, design, and construction of a concentration plant and advanced materials processing plant. The company is headquartered in Sydney, Australia.

- Mount Weld mine has been under development since 2000. From 2000-2006, the company raised A$680 million. The rare earth project was suspended in early 2009 due to withdrawal of the company's previously arranged debt financing. However, in November 2009 as the markets improved, the company was able to raise approximately $450 million in equity; the proceeds are being used to complete construction and the commissioning of both the concentration plant and the Lynas advanced materials Plant (LAMP).

- The REO resources at Mount Weld was last updated in September 2010; the resource estimate for the deposit with a higher distribution of HREE increased threefold to 7.62 million tonnes at a grade of 4.8% REO for a total of 366,000 tonnes REO. The combined Mineral Resource estimate is now 17.49 million tonnes at 8.1% REO.

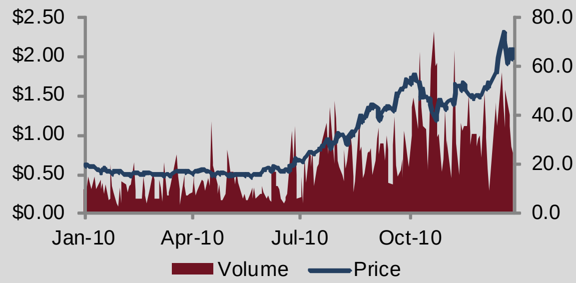
- At Mount Weld, ore will be concentrated by flotation to 40% rare earths oxide, which will then be shipped to Malaysia. Lynas is building an advanced materials plant in Malaysia; which is a good location as it offers 0% taxes for 12 years, and has economic and abundant supplies of natural gas, electricity, and sulphuric and hydrochloric acid supplies.

- Lynas has signed a number of long-term contracts. The company has a 10-year long-term contract with extension terms with Rhodia, a leading manufacturer of rare earth materials, and multi-term long-term contracts with two additional customers. In addition, Lynas has signed three letters of intent with three more potential customers.

- Good infrastructure. Production target: 3Q2011. Initial capacity is designed at 11,000 tonnes of separated rare earths oxide per annum, with a possibility of expansion to 22,000 tonnes per annum.

Ticker	ASX:LYC
Date	January 17, 2011
Share Price	$1.99
52 Week High	$2.35
52 Week Low	$0.38
Shares Outstanding	1662.5
Market Cap	$3,306.6
Net Debt	(364.1)
Cash & Short Term Investments	$364.1
Debt	$0.0
Total Enterprise Value	$2,942.5

Price/Volume Chart



Project Details

Name	Mount Weld
Location	Laverton, Western Australia
Stage of Production	Construction
Size of Property	n/a
Type of Ore	Supergene Monazite
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	8.1% TREO
Resource's Principal REEs	25.5% La, 46.7% Ce, 5.3% Pr, 18.5% Nd, 2.3% Sm, 0.44% Eu, 0.07%Tb
Average Grade of Other Principal By-products	n/a
Off take agreement	Yes (Rhoida)
Target Production (year)	2011
Target Production (tonnage)	10,500 tpa REO initially, expansion to 22,000 tpa REO
Resource	
Total Resources	17.49 Mt @ 8.3% REO
Ownership	n/a

Arafura Resources Limited

Arafura Resources Limited, together with its subsidiaries, engages in the exploration, evaluation, and development of mineral properties in Australia. It primarily explores for rare earth elements, phosphate, nickel, copper, vanadium, uranium, phosphoric acid, calcium chloride, and gold deposits. Arafura Resources' principal property includes the Nolans project located in the central Aileron province of the Arunta region. The company is based in Perth, Australia.

- The resource is exposed at surface, and the company estimates that it will be a small open-pit operation, mining to a depth of about 150 meters. About 6 million tonnes of material are expected to be mined each year. Initially, approximately 1 million tonnes per year will be fed to an on-site beneficiation plant for upgrading to a mineral concentrate. The remaining 5 million tonnes of materials will be placed in overburden rock storage areas.

- At Nolans Bore, JORC compliant resources is currently at 30.3 million tonnes of measured, indicated and inferred resources, containing 850,000 tonnes of REO (grading 2.8% REO); 3.9 million tonnes of phosphate pentoxide (grading 12.9% P2O5); 13.3 million pounds of uranium (grading 0.44 lb/t U3O8).

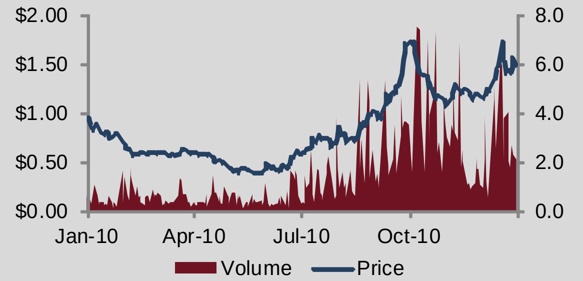
- Arafura will process mineral concentrate from the Nolans Bore mine at its rare earths complex on the northern limits of Whyalla, about 2,000 km away from the mine, on the western shores of Spencer Gulf. Whyalla was the preferred location for the complex because of the area's existing infrastructure, such as good roads, rail and port facilities, access to a skilled workforce, proximity to seawater for a desalination plant, and the South Australian Government's support of the project.

- Over the next 15 months, Arafura Resources will seek government environmental approvals for the Whyalla Rare Earths Complex.

- Infrastructure development required. Target production: 2013. Arafura plans to produce 20,000 tonnes per year of REO (with a relatively high proportion of neodymium and cerium); 80,000 tonnes per year of Phosphoric acid (P2O5) as 61% technical-grade phosphoric acid; 500,000 tonnes per year of Gypsum; and 150 tonnes per year of Uranium oxide (U3O8).

Ticker	ASX:ARU
Date	January 17, 2011
Share Price	$1.53
52 Week High	$1.79
52 Week Low	$0.38
Shares Outstanding	367.9
Market Cap	$562.3
Net Debt	(21.1)
Cash & Short Term Investments	$21.2
Debt	$0.0
Total Enterprise Value	$541.1

Price/Volume Chart



Project Details

Name	Norlans
Location	Alice Springs, NT, Australia
Stage of Production:	Metallurgy
Size of Property	49,000 ha
Type of Ore	Magnetite
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	2.6% TREE
Resource's Principal REEs	19.7% La, 47.5% Ce, 5.8%Pr, 21.2% Nd
Average Grade of Other Principal By-products	29.2% FE, 6.5% TiO_2
Off take agreement	n/a
Target Production (year)	2013
Target Production (tonnage)	20,000 tpa REO, 80,000 tpa P2O5, 150 tpa U3O8, 500,000 tpa CaSO4
Resource	
Total	30.3 Mt at 2.6% REO, 12.2% P_2O_5, 0.40 U_3O_8lb/t
Ownership	100%

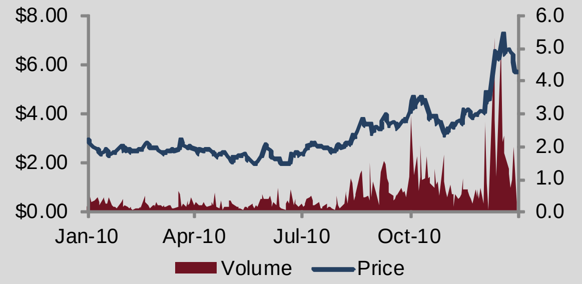
Avalon Rare Metals

Avalon Rare Metals Inc. engages in the development and exploration of rare metals and minerals in Canada. The company primarily explores for lithium, beryllium, indium, gallium, and rare earth elements, such as neodymium and terbium; and rare minerals, including calcium feldspar. It holds interests primarily in the Thor Lake rare metals project located in the Mackenzie mining district of the Northwest Territories; Separation Rapids rare metals project and Warren Township Anorthosite project located in Ontario; and East Kemptville rare metals project located in Nova Scotia. The company was formerly known as Avalon Ventures Ltd. and changed its name to Avalon Rare Metals Inc. in February 2009. Avalon Rare Metals Inc. was founded in 1991 and is based in Toronto, Canada.

- Owns 100% of the Nechalacho Rare Earth Element Project located at Thor Lake, Northwest Territories. Potential development for an underground mine with an 18-year mine life.
- In the Basal Zone, indicated mineral resources were estimated at 20.45 million tonnes with 1.75% TREO and 0.23 HREO/TREO ratio; inferred mineral resources were estimated at 182.56 million tonnes with 1.4% TREO and 0.147 HREO/TREO ratio. The results show relatively low grades TREO but high heavy REE content.
- The life of the plan mine indicates that mineral reserves of 12 million tonnes, at an average grade of 1.70% TREO including 0.38% HREO, 3.16% ZrO2, 0.41% Nb2O5 and 0.041% Ta2O5, would be mined over a period of 18 years.
- Considerable portion of the total revenue is expected to be from co-products (i.e. zirconium and niobium) sales.
- Infrastructure development required. Plans to develop metallurgic plant in 2015/2016.
- Project stage: advance exploration. Production start expected 2015.
- Avalon's other projects include the Separation Rapids lithium project, the Lilypads tantalum project and the Warren Township Calcium Feldspar project all in Ontario; and the East Kemptville tin-indium-gallium-germanium in Nova Scotia.

Ticker	TSX:AVL
Date	January 17, 2011
Share Price	$5.70
52 Week High	$8.14
52 Week Low	$1.89
Shares Outstanding	92.4
Market Cap	$526.6
Net Debt	(39.2)
Cash & Short Term Investments	$39.2
Debt	$0.0
Total Enterprise Value	$487.4

Price/Volume Chart



Project Details

Name	Thor Lake (Nechalacho)
Location	Thor Lake, NW Territories, Canada
Stage of Production:	Feasibility
Size of Property	4,250 ha
Type of Ore	Syenite
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	1.43% TREO
Resource's Principal REEs	15.2% La, 34.2% Ce, 4.3% Pr, 17.1% Nd, 3.8% Sm, 3.2% Dy
Average Grade of Other Principal By-products	Nb_2O_5, ZrO_2
Off take agreement	n/a
Target Production (year)	2015
Target Production (tonnage)	5,000 to 15,000 tpa TREO
Resource	
Measured	n/a
Indicated	21.4 Mt at 1.64% TREO
Inferred	182.6 Mt at 1.40% TREO
Ownership	100.0%

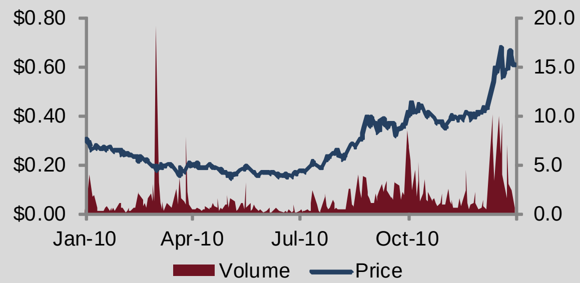
Great Western Minerals Group

Great Western Minerals Group Ltd. engages in the acquisition, exploration, and development of metal properties in the United States, Canada, and South Africa. It explores for rare earth elements, base metals, and precious metals. The company primarily owns the Hoidas Lake rare earth property that consists of 14 claims totaling 12,522 hectares and is located in northern Saskatchewan; and the Steenkampskraal Mine located to the north of the town of Vanrhynsdorp in the Western Cape province of South Africa. It also manufactures and produces specialty alloys, powders, and related products used in the aerospace, automobile, industrial, computer, and high-tech industries. In addition, the company manufactures and supplies high purity metals and ultra-high purity indium. Great Western Minerals Group Ltd. was incorporated in 1983 and is based in Saskatoon, Canada.

- Integrated rare earth processor, owns 100% Hoidas Lake deposit. NI 43-101 mineral resources are estimated at 2.8 million tonnes with 2.14% REO (@1.15% cut-off grade).
- Holds 100% exclusive access to rare earths from the Steenkampskraal mine, which remains the highest grade rare earths deposit in the world, with an average in situ grade of 17% total rare earth oxide. The other economic mineral in the ore is chalcopyrite, which results in the ore averaging 0.8% copper and 0.5 grams of gold per tonne.
- Great Western Minerals Group Ltd. seeks to become the first vertically integrated rare earth elements producer in North America.
  - Owns 100% of Great Western Technologies, a leading production facility in North America for extractive metallurgy, mineral processing, and specialty alloys manufacturing in the rare earth materials market.
  - Owns 100% of LCM in UK, a manufacturer and supplier of rare earth-based alloys and high purity metals focused on the permanent magnet industry.
- Holds interests in eight additional rare earth exploration and development properties in North America and Africa.
- Well-developed downstream infrastructure. Steenkampskraal, a former producing mine, estimated to re-start production in 2014 with 5,000 tonnes.

Ticker	TSXV:GWG
Date	January 17, 2011
Share Price	$0.61
52 Week High	$0.70
52 Week Low	$0.15
Shares Outstanding	354.2
Market Cap	$216.0
Net Debt	$3.9
Cash & Short Term Investments	$2.4
Debt	$6.3
Total Enterprise Value	$220.0

Price/Volume Chart



Project Details	
Name	Hoidas Lake
Location	Saskatchewan, Canada
Stage of Production:	Feasibility
Size of Property	12,522 ha
Type of Ore	Granite
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	2.0% TREE, 2.1% TREO
Resource's Principal REEs	20.44% La, 46.62% Ce, 5.97% Pr, 20.57% Nd, 2.71% Sm
Average Grade of Other Principal By-products	17% P_2O_5
Off take agreement	n/a
Target Production (year)	2014
Target Production (tonnage)	5,000 tpa TREO
Resource	
Measured	0.96 Mt at 2.1% REE, 2.57% REO
Indicated	1.60 Mt at 1.96% REE, 2.35% REO
Inferred	0.29 Mt at 2.03% REE, 2.14% REO
Ownership	100%

Molycorp Incorporated

Molycorp, Inc., a development stage company, focuses on the production and sale of rare earth oxides (REOs) from stockpiled feedstocks in the western hemisphere. It operates the Mountain Pass mine, a non-Chinese rare earth deposit. The company was founded in 2008 and is based in Greenwood Village, Colorado.

- Mountain Pass mine operations began in 1952. In 2002, mining was suspended due to softening prices for REOs; lack of additional tailings disposal capacity and waste water disposal problems. Revenues have been primarily from the processing of stockpiled ore. Molycorp plans to re-start mining operations and modernize its processing facility.

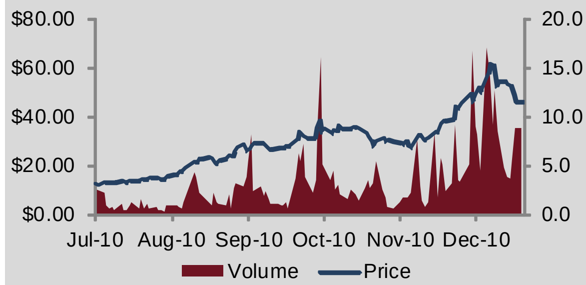
- At Mountain Pass, proven reserves are estimated at 88.0 million pounds of REO contained in 0.480 million tonnes of ore, with an average ore grade of 9.38% and probable reserves are estimated at 2.12 billion pounds of REO contained in 13.108 million tonnes of ore, with an average ore grade of 8.20%, in each case using a cut-off grade of 5.0%. Expected mine life is in excess of 30 years.

- Molycorp announced that it has entered into a $130 million equity and debt financing agreement with Sumitomo Corporation, for Molycorp's use in completing its rare earth "Mine-to-Magnets" manufacturing supply chain. In exchange, Molycorp will provide Sumitomo with substantial quantities of several rare earth products over the next seven years.

- Vertical integration: the company is pursuing joint venture opportunities to integrate downstream into NdFeB magnet manufacturing in the United States. NdFeB magnets, which are critical components of “green” technologies and in the miniaturization of electronics, are primarily manufactured in China (approximately 80%) and Japan (approximately 20%). If successful, the downstream integration would make Molycorp the only fully integrated producer of NdFeB magnets outside of China.
    - Signed an agreement with Hitachi metals for the production of rare earth alloys and magnets in the U.S. The ventures would be focused on the manufacture of neodymium-iron-boron (NdFeB) alloys and magnets that are vital to many clean energy, automotive, computer, health-care, communications and other technologies.

Ticker	NYSE:MCP
Date	January 17, 2011
Share Price	$45.71
52 Week High	$62.80
52 Week Low	$12.10
Shares Outstanding	82.3
Market Cap	$3,761.5
Net Debt	(357.7)
Cash & Short Term Investments	$362.9
Debt	$5.2
Total Enterprise Value	$3,403.8

Price/Volume Chart



Project Details

Name	Mountain Pass
Location	San Bernardino, California, U.S.
Stage of Production	Production/ Expansion
Size of Property	n/a
Type of Ore	Carbonatite and Alkaline complexes
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	8.2% TREO
Resource's Principal REEs	n/a
Average Grade of Other Principal By-products	n/a
Off take agreement	Yes (Neo Materials, Hitachi)
Target Production (year)	2012
Target Production (tonnage)	20,000 tpa REO with potential to double production
Reserves	
Proven	0.48 Mt at 9.38% REO
Probable	13.59 Mt at 8.24% REO
Ownership	100%

    - Entered into a nonbinding letter of intent with Neo Material Technologies Inc., which involves a technology transfer agreement pursuant to which Neo Material may provide Molycorp with technical assistance and know-how with respect to the production of rare earth metals, alloys and magnets; in exchange for sale of rare earth oxides.

- Well-developed infrastructure. Production target date: 2012, with 20,000 tonnes of REO per year.

Quest Rare Minerals

Quest Rare Minerals Ltd. engages in the identification and discovery of rare earth deposit opportunities in North America. It has interests in the Strange Lake property and the Misery Lake property located in Labrador; the Plaster Rock property situated in Carboniferous-age basin, known as the Plaster Rock basin, northwestern New Brunswick; and the Kenora North and the Snook Lake uranium projects situated in northwestern Ontario. The company was formerly known as Quest Uranium Corporation and changed its name to Quest Rare Minerals Ltd. on April 26, 2010. Quest Rare Minerals Ltd. was incorporated in 2007 and is headquartered in Montreal, Canada.

- Historical pre-NI 43-101 results on the Strange Lake deposit indicated 52 Mt @ 3.25% ZrO_2, 0.66% Y_2O_3, 0.56% Nb_2O_3, 1.3% TREO. NI 43-101 Preliminary Resource Estimate of the B Zone rare earth deposit indicates that the zone contains an inferred resource of close to 115 Mt at 1.0% TREO (cut-off grade 0.85%).

- Strange Lake B Zone is rich in heavy rare earth oxide (HREO), estimated at 43% HREO; percentage of HREO content expected to increase with increasing TREO percent.

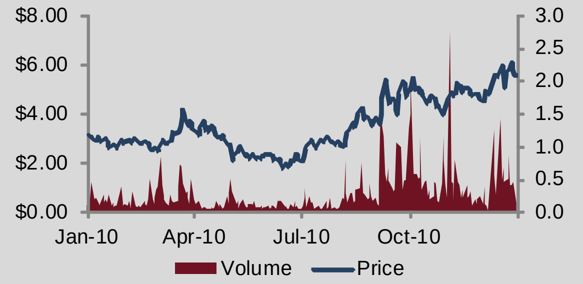
- A metallurgical study on a one-ton bulk sample showed strong REE recoveries of between 77% and 93% for all of the rare earths detected in the deposit.

- The mine model calls for an open-pit production rate of 4,000 tonnes per day, requiring a capital expenditure of $563.4 million (including a 25% contingency), a payback in the fourth year of production and a minimum mine life of 25 years.

- Infrastructure development required.

Ticker	TSXV:QRM
Date	January 17, 2011
Share Price	$5.57
52 Week High	$6.23
52 Week Low	$1.74
Shares Outstanding	56.5
Market Cap	$314.4
Net Debt	(3.6)
Cash & Short Term Investments	$3.6
Debt	$0.0
Total Enterprise Value	$310.8

Price/Volume Chart



Project Details

Name	Strange Lake
Location	NW of Schefferville, Quebec, Canada
Stage of Production	Exploration
Size of Property	54,000 ha
Type of Ore	Granite
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	1.0% TREO
Resource's Principal REEs	1.973% Zr, 0.208% Nb, 0.053% Hf 0.082% Be
Average Grade of Other Principal By-products	25% Fe, 1.2% P
Off take agreement	n/a
Target Production (year)	2016
Target Production (tonnage)	n/a
Resource	n/a
Measured	0%
Indicated	0%
Inferred	114.823 Mt at 1% REO, 43% HREO
Ownership	100%

Stans Energy Corporation

Stans Energy Corp. engages in the acquisition, exploration, and development of mineral properties containing rare earth elements (REE), uranium, and associated metals in the Kyrgyz Republic. The company owns a 100% interest in the mining claims comprising three properties, including Shaltin located near Bishkek in northern Kyrgyzstan; Kyzyluraan located near the Toktogul Reservoir in central Kyrgyzstan; and Kapkatash located in southern Kyrgyzstan. Stans Energy Corp. and is based in Toronto, Canada.

- Kutessay II (100% owned) is a past-producing Heavy Rare Earth Elements (HREEs) mine. Previously produced 80% of the former Soviet Union's REEs from 1960-1991.

- In November 2010, Stans Energy Corp. in cooperation with the Canadian Embassy in Russia, organized a round table discussion to start a trilateral business initiative between Russia, Kyrgyzstan, and Canada to create a new rare earth products supply chain. The CIS region has the second largest REE reserves in the world.

- Stans Energy owns a 20-year mining license for the property, and the company is currently completing a JORC resource estimate.

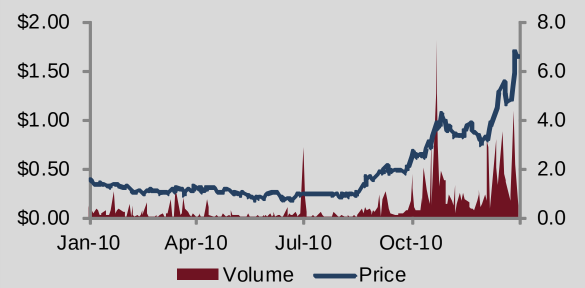
- 30 years of proven metallurgy, with an approximate 65% recovery rate. Option for purchase of metallurgical plant. Reported historical production ratio of approximately 50/50 Light Rare Earth Elements (LREEs) to Heavy Rare Earth Elements (HREEs). Deposit also contains other materials, e.g. thorium, silver, molybdenum, lead, zinc, etc.

- Well-developed surrounding infrastructure. Work required modernizing processing facility.

- Project stage: Pre-feasibility. Target production date: 2014.

Ticker	TSXV:RUU
Date	January 17, 2011
Share Price	$1.65
52 Week High	$1.84
52 Week Low	$0.19
Shares Outstanding	130.0
Market Cap	$214.5
Net Debt	(1.7)
Cash & Short Term Investments	$1.7
Debt	$0.0
Total Enterprise Value	$212.7

Price/Volume Chart



Project Details

Name	Kutessay II
Location	Kemin area, Kyrgyzstan
Stage of Production	Discovery Delineation
Size of Property	4,000 ha
Type of Ore	Granite
NI 43-101 (or equivalent)	No
Average TREO or TREE	n/a
Resource's Principal REEs	27.6% Y, 25.9% Ce, 9.4% La, 8.8% Nd, 5.0% Er, 3.9% Sm
Average Grade of Other Principal By-products	n/a
Off take agreement	n/a
Target Production (year)	n/a
Target Production (tonnage)	n/a
Resource	
Measured	n/a
Indicated	n/a
Inferred	n/a
Ownership	100%

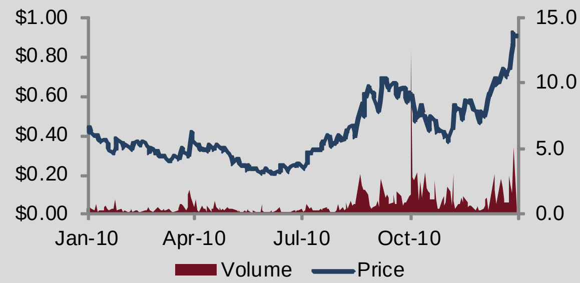
Ucore Rare Metals Incorporated

Ucore Rare Metals Inc. engages in the exploration and development of rare earth element and uranium properties. The company's principal property includes Bokan Mountain/Dotson Ridge property, which is located on the southern part of the Prince of Wales Island in southeastern Alaska. It also has properties in Nunavut, Northern Manitoba; Marie, Ontario; in Stephenville, Newfoundland, and in Labrador. The company was formerly known as Ucore Uranium Inc. and changed its name to Ucore Rare Metals Inc. in June 2010. Ucore Rare Metals Inc. is based in Halifax, Canada.

- The Bokan Mountain project covers 30 sq. km (19 sq. miles) and includes the former high grade Ross Adams Mine, which is Alaska's only prior producing uranium mine (1958-71). Produced 1.3 million pounds U3O8 @0.76%.
- Historic estimate: Uranium (U3O8) - 11.7 M lbs; Rare earths (TREO, including Y) – 374 M lbs
- Conceptual estimate: 3.5-6.5 Mt @ 0.76 -1.46 TREO (50% HREO). Estimated as possibly one of the largest combined heavy & light rare earth deposits in North America. The company claims that it has secured the mineral title and there are no land claim issues.
- Important dates: 1Q2011: NI 43-101 inferred resource; 2Q2011: metallurgical study report.
- Looking for strategic partners to build Alaska-based separation and refining facility. Multiple prospects and multiple commodities.
- Well-developed infrastructure.

Ticker	TSXV:UCU
Date	January 17, 2011
Share Price	$0.91
52 Week High	$0.94
52 Week Low	$0.20
Shares Outstanding	111.7
Market Cap	$101.6
Net Debt	(3.1)
Cash & Short Term Investments	$3.1
Debt	$0.0
Total Enterprise Value	$98.5

Price/Volume Chart



Project Details

Name	Bokan Mountain
Location	SE Alaska, U.S.
Stage of Production	Discovery Delineation
Size of Property	3,000 ha
Type of Ore	Peralkaline
NI 43-101 (or equivalent)	No
Average TREO or TREE	n/a
Resource's Principal REEs	n/a
Average Grade of Other Principal By-products	n/a
Off take agreement	n/a
Target Production (year)	n/a
Target Production (tonnage)	n/a
Resource	50% HREO, 374k lbs REO, 11M lbs U, 96M lbs Nb (Historical)
Ownership	100%

Hudson Resources Incorporated

Hudson Resources Inc. engages in the acquisition, exploration, and development of diamond mineral properties and rare earth elements in West Greenland. It holds interests in 6 contiguous exploration licenses totaling approximately 1,800 square kilometers in the Sarfartoq region, near Kangerlussuaq, Greenland. The company was formerly known as Tekwerks Solutions Inc. and changed its name to Hudson Resources Inc. in December 2002. Hudson Resources Inc. was incorporated in 2000 and is based in Vancouver, Canada.

- Hudson is focused on projects in Greenland, which include the Sarfartoq Carbonatite Project, and hosts rare earth elements, and specialty metals niobium and tantalum; and the Garnet Lake Diamond Project. Both projects are 100%-controlled by Hudson.

- In January 2011, the company released its first NI 43-101 compliant inferred resource estimate of 14.1M tonnes averaging 1.51% total rare earth oxides (TREO) for the ST1 Zone in Sarfartoq. The ST1 Zone remains open for expansion with further drilling and is just one of several zones with established REE potential.

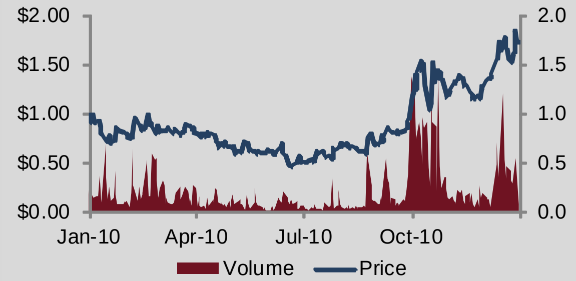
- Hudson plans to undertake higher-density diamond drilling commencing in May 2011 with the objective of upgrading the resource to indicated status and increasing tonnage. The resource estimate suggests that the ST1 Zone may represent one of the industry's highest ratios of neodymium and praseodymium to TREO totaling 25%.

- Metallurgical test-work expected to be completed in the first half of 2011. Preliminary Economic Assessment expected before the end of 2011.

- Infrastructure development required.

Ticker	TSXV:HUD
Date	January 17, 2011
Share Price	$1.73
52 Week High	$1.86
52 Week Low	$0.46
Shares Outstanding	60.8
Market Cap	$105.2
Net Debt	(4.1)
Cash & Short Term Investments	$4.1
Debt	$0.0
Total Enterprise Value	$101.1

Price/Volume Chart



Project Details

Name	Sarfartoq
Location	Greenland
Stage of Production:	Exploration
Size of Property	130,000 ha
Type of Ore	Carbonatite
NI 43-101 (or equivalent)	No
Average TREO or TREE	1.5% TREO
Resource's Principal REEs	n/a
Average Grade of Other Principal By-products	1.8% Nd_2O_3, 417 ppm Eu
Off take agreement	n/a
Target Production (year)	n/a
Target Production (tonnage)	n/a
Resource	
Measured	n/a
Indicated	n/a
Inferred	14.1Mt @ 1.51% REO
Ownership	100%

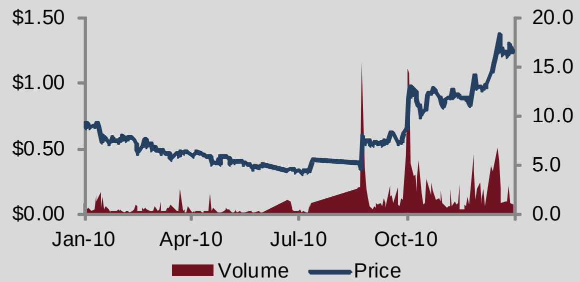
Greenland Minerals and Energy Limited

Greenland Minerals and Energy Limited engage in the exploration and development of mineral resources, primarily rare earth elements in Greenland. It primarily holds interests in the Kvanefjeld project and explores for rare earth oxides and uranium oxides. The company was formerly known as The Gold Company Ltd. and changed its name to Greenland Minerals and Energy Limited in August 2007. Greenland Minerals and Energy Limited is headquartered in West Perth, Australia.

- Owns Kvanefjeld Multi-Element deposit, which contains rare earth elements, uranium, zinc, sodium fluoride, and other speciality metals.
- Initial pre-feasibility study outcomes indicate potential for Kvanefjeld to become an economically robust, large-scale producer of RE concentrate and uranium oxide.
- Initial study estimated that the mine can produce 43,729 tonnes of REO and 3,895 tonnes of uranium per year during a 23-year lifespan.
- Pre-feasibility final report scheduled for 2Q2011. Definitive feasibility study to commence mid-2011.
- Environmental policy disclosure: "Greenland Minerals and Energy Ltd is aware of and respects the Greenlandic government stance on uranium exploration and development in Greenland – which is currently a zero tolerance approach to the exploration and exploitation of uranium. However, a new amendment has now been introduced to the exploration license term that creates a framework for the evaluation and permitting of projects that include uranium."
- Infrastructure development required. Target production 2015/2016

Ticker	ASX:GGG
Date	January 17, 2011
Share Price	$1.25
52 Week High	$1.37
52 Week Low	$0.31
Shares Outstanding	295.1
Market Cap	$370.1
Net Debt	(3.9)
Cash & Short Term Investments	$3.9
Debt	$0.0
Total Enterprise Value	$366.2

Price/Volume Chart



Project Details

Name	Kvanefjeld
Location	Nasarq, Greenland
Stage of Production:	Feasibility
Size of Property	n/a
Type of Ore	Alkaline intrusive complex
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	1.07% TREO
Resource's Principal REEs	42% Ce, 27.5% La, 12.9% Nd, 4.2% Pr
Average Grade of Other Principal By-products	0.028% U_3O_8, 0.22% ZN, 1.36% NaF
Off take agreement	n/a
Target Production (year)	2015
Target Production (tonnage)	43,729 tpa REO, 3.895 tpa U_3O_8
Resource	
Measured	n/a
Indicated	365 Mt at 1.06% TREO
Inferred	92 Mt at 1.12% TREO
Total	457 Mt at 1.07% TREO
Ownership	100%

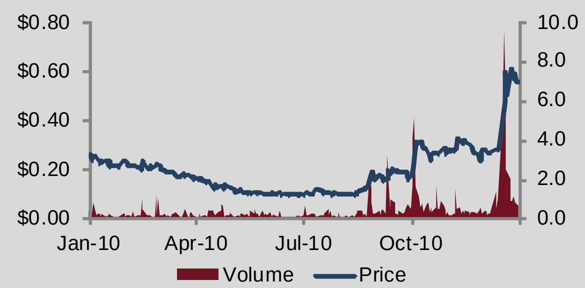
Pele Mountain Resources

Pele Mountain Resources Inc. engages in the acquisition, exploration, and development of mineral resource properties in northern Ontario, Canada. The company explores for uranium, gold, silver, diamond, nickel, copper, platinum group elements, zinc, and lead ores. It principally focuses on Eco Ridge Mine Uranium and Rare Earth Element project, Highland Gold project, and the Ardeen Gold and Sudbury Nickel projects. The company is headquartered in Toronto, Canada.

- NI 43-101 Scoping Study at Eco Ridge Mine outlined a base case scenario of an 18-year mine life, with 218,000 kg of recoverable rare earth oxides annually, in addition to 826,000 lbs of U3O8. New studies ongoing to optimize economic model.
- Environmental impact minimized by underground bioleaching & surface heap leaching with all leachate recycled in a closed circuit.
- Rare earth elements to provide potential by-products in addition to uranium production.
- Extensive REE mineralization in main conglomerate bed. According to the company, every drill hole analyzed for REE returned significant values of all REEs. Elliot Lake is the only location in Canada with history of successful commercial REE production as by-products of uranium production.
- Processing and recovery of REE at Elliot Lake are well understood as a result of historic commercial production. Average 64% recovery of combined Yttrium and Heavy REE in leach testing of Eco Ridge drill core.
- Outstanding infrastructure including roads, power, airport, nearby deep water port and a qualified workforce already in place at Elliot Lake. Production target date: 2016.

Ticker	TSXV:GEM
Date	January 17, 2011
Share Price	$0.56
52 Week High	$0.67
52 Week Low	$0.09
Shares Outstanding	127.9
Market Cap	$71.6
Net Debt	(2.1)
Cash & Short Term Investments	$2.1
Debt	$0.0
Total Enterprise Value	$69.5

Price/Volume Chart



Project Details

Name	Eco Ridge
Location	Elliot Lake, Ontario, Canada
Stage of Production:	Pre-feasibility
Size of Property	n/a
Type of Ore	Quartzite
NI 43-101 (or equivalent)	Yes
Average TREO or TREE	
Resource's Prinipal REEs	Ce, Th, La, Nd, Pr, Sm, Y
Average Grade of Main product	0.045% U_3O_8
Off take agreement	n/a
Target Production (year)	n/a
Target Production (tonnage)	826,000 lbs U_3O_8
Resource	
Measured	n/a
Indicated	5.68 Mt at 0.051% U_3O_8
Inferred	37.26 Mt at 0.044% U_3O_8
Ownership	100%

Acronyms

BGS	British Geological Survey
FMV	Fair Market Value
HREE	Heavy Rare Earth Element(s)
IMCOA	Industrial Minerals Company of Australia
JSI	Jacob Securities Inc.
LCM	Less Common Metals Ltd.
LME	London Metal Exchange
LREE	Light Rare Earth Element(s)
NdFeB	Neodymium Iron Boron - magnet
NiMH	Nickel metal hydride - battery
NYMEX	New York Mercantile Exchange
OECD	Organisation for Economic Co-operation and Development
R&D	Research and Development
REE	Rare Earth Element(s)
REO	Rare Earth Oxide(s)
TREE	Total Rare Earth Element(s)
TREO	Total Rare Earth Oxide(s)
UN ComTrade	United Nations Commodities Trade
USGS	United States Geological Survey
WTO	World Trade Organization

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