

Rare Earth Elements Letter

INTERNATIONAL

the independent information and advice bulletin for Rare Earth Elements and related investments

April 2011

➤ Rare Earths Materials

play key role in advanced environmental and modern technical products

The “**REE**” Rare Earth Elements group, known as the lanthanide series, consists of 15 elements:

lanthanum (La)	terbium (Tb)
cerium (Ce)	dysprosium (Dy)
praseodymium (Pr)	holmium (Ho)
neodymium (Nd)	erbium (Er)
promethium (Pm)	thulium (Tm)
samarium (Sm)	ytterbium (Yb)
europium (Eu)	lutetium (Lu)
gadolinium (Gd)	

The elements yttrium (Y) and scandium (Sc) are also lumped in with Rare Earths because they have similar chemical properties making 17 REE's in total.

In the oxide form, the group is collectively known as Rare Earths Oxides (REOs).

REE's are frequently found associated with radioactive elements, such as uranium and thorium, making mining them dangerous and subject to environmental restrictions.

Rare Earths play a key role in advanced green environmental products from energy efficient compact fluorescent light bulbs to hybrid cars, automotive catalytic converters and wind turbine generators. They are also essential in the development and manufacturing of many modern technological products from hard disc drives to flat panel displays, iPods and magnetic resonance imaging (MRI) scans.

Many defense applications, including missile guidance systems, mine detection, anti-missile defense and communication systems, also require rare earths elements.

Because of the large number of high-technology and defense applications that require rare earths, dependable, quality resources, are important to the Western economies and critical to continued manufacturing and production.

➤ Rare Earths prices

Due to the global economic slowdown which began in the fourth quarter of 2008, many industries have been experiencing inventory destocking as customers use existing inventory to preserve cash. This has caused raw material process to slump significantly at the upstream end of the supply chain.

The June 2008 Rare earths price for Lynas' average Mount Weld composition was US\$ 15.22/kg REO on a FOB basis, by June 2009 this dropped to US\$ 9.52/kg REO, a decline of 37%. In the same period the average composition price for China's Baotou Mine declined 40% from US\$ 12.67 to US\$ 7.65/kg REO.

When export quota costs, export tariff and value added tax are taken into account a Chinese company is estimated to receive less than US\$ 5.00/kg. These price levels are believed to be at the cash cost of production within China, which have increased from approximately US\$ 3.50/kg REO in 2002/03 to approximately US\$ 5.50/kg over the last five years due to higher energy, chemical reagents, labour and environmental compliance costs.

Pricing

Rare Earth Oxide (Purity 99% min)	Price June 2001	Price June 2002	Price June 2003	Price June 2004	Price June 2005	Price June 2006	Price June 2007	Price June 2008	Price June 2009	Price change 2008 – 2009
Lanthanum Oxide	7.00	2.30	1.50	1.62	1.45	2.15	2.82	8.83	5.90	-33%
Cerium Oxide	4.00	2.25	1.68	1.62	1.37	1.65	2.63	4.38	3.80	-13%
Neodymium Oxide	11.00	4.35	4.42	5.75	6.05	11.07	31.15	32.88	14.50	-56%
Praseodymium Oxide	6.20	3.94	4.19	8.00	7.55	10.70	30.37	32.61	14.50	-56%
Samarium Oxide	9.00	2.98	2.67	2.67	2.60	2.40	3.12	4.80	4.75	-1%
Dysprosium Oxide	35.00	20.00	14.60	30.30	36.40	70.44	88.30	120.80	112.00	-7%
Europium Oxide	310.00	240.00	235.40	310.50	286.20	240.00	311.00	491.00	495.00	1%
Terbium Oxide	135.00	170.00	170.00	398.20	300.00	434.00	575.40	740.00	360.00	-51%
Av. Mt Weld Composition	7.81	3.97	3.48	4.45	4.15	5.50	11.40	15.22	9.52	-37%
Av. Baotou Composition	6.66	3.17	2.68	3.29	3.08	4.33	9.42	12.67	7.65	-40%

Due to the strong reduction of export quotas, Rare earth prices have skyrocketed since the end of 2009, having sixteen-folded from US\$ 10.32 at the end of 2009 to US\$ 160 by the end of April 2011.



➤ China controls the world's Rare Earths industry

The strategic value of secure Rare Earth supplies has been much better and earlier understood in China than in the Western world. Already the late Chinese leader Deng Xiaoping once said "There is oil in the Middle East, there is Rare Earth in China". He foresaw the

West's growing dependence on these elements for high-tech industries and put China on course to become the world's dominant supplier today with 95% of Rare Earths production.

In 2009, the analogy to oil reserves is even more striking with Rare Earths use in zero-emission energy generation technology such as wind and solar.

However, the path that has led China to a virtual monopoly has not been without its own issues. The Chinese State-Owned Enterprises (SOE) that gained the processing technology could not protect this intellectual property.

As a result, the Chinese Rare Earths industry grew rapidly in the 1990s as many smaller Chinese enterprises set up Rare Earths processing plants. This led to intensive competition between Chinese producers which in turn drove down prices of rare Earths from the high prices associated with "specialty chemicals" to significantly lower "commodity" prices in a few short years.

Mining of rare Earths within China also grew unchecked within the provinces, especially in the south where small artisanal mining is possible. The main mine in China is the Bayan Obo Mine near Baotou in Inner Mongolia. This is controlled by a large SOE, Baotou Iron, and produced approximately 50,000 tonnes Rare Earth Oxides.

A second region is located in the Sichuan Province and is less consolidated. This region has lower value resources and mining is now underground, as opposed to open-pit mining.

Sichuan has an estimated capacity of up to 20,000 tonnes REO, and is reported being consolidated by Jiangxi Copper, which company shall invest in the required infrastructure and upgrading of processing plants.

The southern region, which comprises of Jiangxi, Guangdong, Hunan and Fujian provinces, mine an "ionic" clay deposit. This is the third region within China producing Rare Earths and most of the "heavy" Rare Earths (europium, terbium, dysprosium and yttrium being the key heavy rare Earths) in demand globally today.

Accurate production figures are unavailable due to the artisanal mining in this region. However, estimates range from 35,000 – 55,000 tonnes REO.

The fragmented Rare Earths mining and processing industry in China suffered from inefficient extraction techniques leading to low recovery and in addition poor environmental protection compliance was prevalent across the industry.

The Chinese authorities realized the industry had to change and rationalization of the industry began in 2003 when export quotas on Rare Earths were introduced and issued to approved local operators.

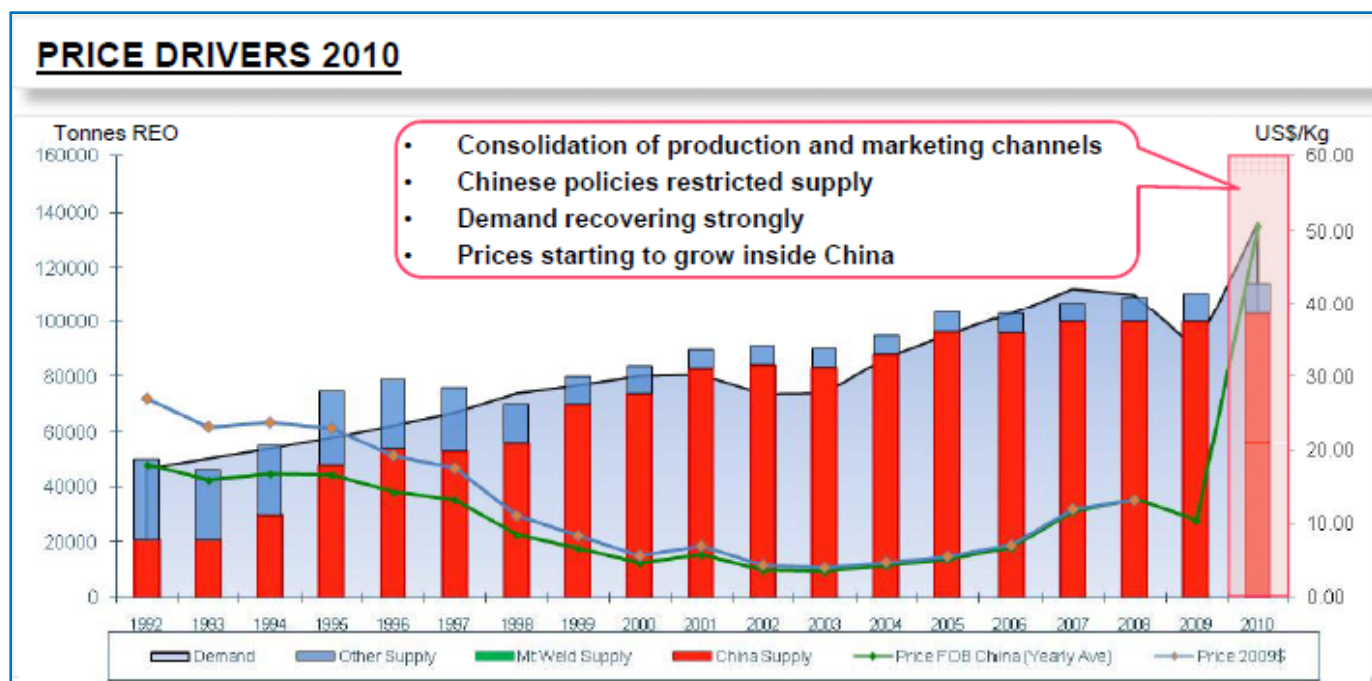
The tonnage of this export quota has been decreasing every each year. In 2006, the volume dropped to 48,000 tonnes, in 2007 to 43,574 tonnes, 2008 to 40,987 tonnes and in 2009 to 33,300 tonnes.

In addition to this export quota for local companies, foreign joint ventures secured export quotas from the Chinese Ministry of Commerce. In 2009, these quotas equaled 16,845 tonnes, giving a grand total of 50,145 tonnes.

These annually declining quotas, in conjunction with tightening of environmental regulation compliance, has led to the closure of many small processing operations.

To protect the fragile Rare Earths resources base within China over mining with low recovery processes and to enforce the environmental standards within the mining industry, the Chinese Government introduced “production quotas” in 2007.

The production quota for Rare Earths concentrates was 82,320 tonnes of REO in 2009, down 6% from 87,620 tonnes in 2008. The quota consisted of 72,300 tonnes for light rare earths from Baotou and Sichuan, down 7.9% as compared to 2008, and 10,020 tonnes for medium and heavy rare earths from the southern ionic region, up 8.87%.



Source: Lynas Corp

Both the Baotou and Sichuan regions appeared to be operating within this production quota policy, however, with the official production quota from the Chinese Ministry of Land and Resources of 10,020 tonnes per annum, the southern “ionic” clay region appears to be producing significantly above this quota level.

There are reports of continued government efforts to reduce mining in the southern ionic clay region, with MinMetals taking the lead in consolidating the mines and processing plants within Jiangxi.

On July 8, 2010, the Ministry of Commerce of China released 7,976 tonnes of approved rare Earths export quota for the second half of 2010, including export quota for both foreign-invested firms (1,768 tonnes) and local firms (1,768 tonnes). The export quota is 72% less than the export quota for the second half of 2009 (28,417 tonnes).

The total export quota for 2010 of 30,259 tonnes is 40% less than the total export quota for 2009 (50,145 tonnes).

Since mid-September, 2010, China blocked shipments of raw rare earths minerals to Japan due to a diplomatic dispute, and to the United States and Europe since mid-October.

However, by the end of October the export embargo to the United States and Europe was ended.

In this respect, it should be noted that from the 2010 export quota of 30,259 tonnes less than 2,000 tonnes remained to be exported by the end of September 2010.

According to Chinese rare earths industry officials the strong cut in export quotas is justified by the fact that after many years of continued growth in exports, the industry didn't receive the profit returns with the policy having been adjusted to ensure that China's resources are optimally utilized.

On December 28, 2010 the Chinese Ministry of Commerce announced the quota allocations for Rare-Earth export quotas for the first half of 2011. A total of 14,508 million tons of Rare-Earth export quotas to 32 different companies in China, a reduction of 35% compared with the quotas for the same period last year when the allocation was 22,282 metric tons. In the first half of 2010, 16,304 metric tons were allocated to Chinese-owned companies and 5,978 metric tons to foreign owned companies.

Of the 14,508 metric tonnes of quota for the first half of 2011, 10,762 metric tons went to 22 Chinese trading companies, and 3,746 metric tons went to 10 foreign-owned companies.

In the latter part of March 2011, the **Chinese Ministry of Land and Resources** published details of the 2011 rare-earth production quotas. The quota consisted of 93,800 tonnes of REOs, made up of 80,400 tonnes of light REOs (LREOs) and 13,400 tonnes of heavy REOs (HREOs).

China's exports of rare earths in the first two months of 2011 came to 7,084 tonnes (source: China's general Administration of Customs). This is up just 0.3% from the first two months of 2010, but about half of what was said to be permitted for sale overseas in the first half of 2011.

As at April 1, 2011, China's Ministry of Finance and State Administration for Taxation has stated levying a higher tax on REE mined in the country. The tax amounts to 30 yuan (US\$ 4.54) per tonne for medium and heavy rare earth elements and 60 yuan (US\$ 9.10) per tonne for light rare earth elements.

The government said it will use the tax to support research on the processing of rare earths, environmental compensation and building reserves.

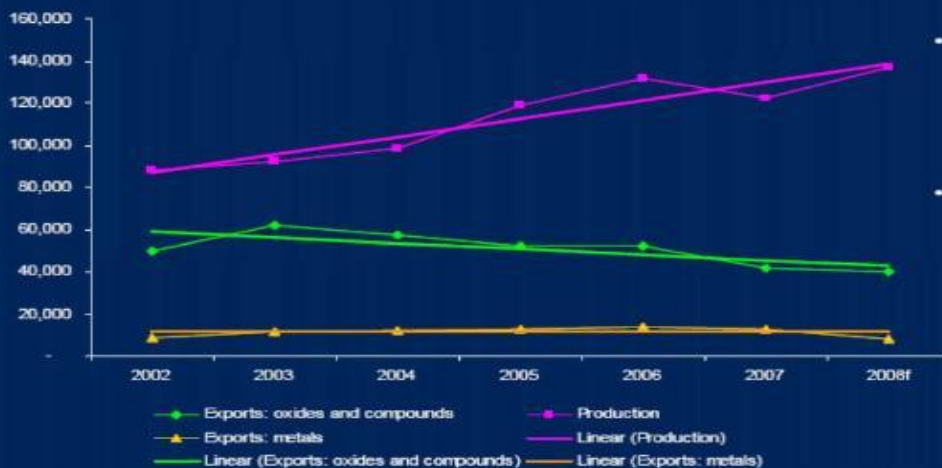
The new taxes will increase production costs for China's largest producer of rare earths, Baotou Steel Rare-Earths High Tech by 720 million yuan (US\$ 109.8 million) in 2011.

➤ **Inner Mongolia Baotou Steel Rare-Earth Hi-Tech (Shanghai - 600111)** is principally engaged in the production and sale of refined rare earth mine products, deep processed rare earth products and new rare earths materials.

In 2010, Baotou produced approximately 62,400 tonnes of REOs.

As at the end of April 2011, the Company, being listed on the Shanghai Stock Exchange, had a market capitalization of approximately US\$ 10.6 billion.

China: A widening gap between production and exports, 2002-2008



- Decreasing availability of REOs and rare earth metals to processors outside China
- Decline in exports of metals and alloys has not been as steep as exports of oxides and compounds but forecasts for 2008 show a significant decline.

Source: Global Trade Atlas, Roskill estimates

Roskill

EXPANDING THE WORLD'S KNOWLEDGE OF METALS AND MINERALS MARKETS

➤ Western hemisphere urged to respond to **China's** Rare Earths monopoly

With China further tightening supply regulations to shore up prices, there is growing urgency to ensure own supplies in the Western hemisphere particularly for Heavy Rare Earth Elements (HREEs), indispensable for high-tech manufacturing.

As to actually producing HREE rich ores and refining them no facilities exist today in the Western world that are extracting and/or refining HREEs to separate and justify them for high technology end uses. All such facilities today are in China.

For the **United States**, it will be necessary to develop, prove-out and construct at least one North American facility to produce the Rare Earth metals and their alloys in metallic form before anyone can make rare earths based magnets for any application.

Molycorp Minerals will be the first company in the western hemisphere to challenge Chinese domination in the production of REE's by reopening its Mountain Pass Mine in California with mining expected to go full scale by 2012.

Lynas Corp., owing the richest deposit of Rare Earths in the world at Mount Weld in Western Australia, the first new project outside China, is expected to be the next producer with the first feed to kiln at the Lynas Advanced Material Plant in Malaysia on target for the third quarter of 2011.

In November 2010, Japanese trading company Sojitz, based in Tokyo Japan, announced that it had forged a \$ 250 million procurement deal with Lynas to start shipping 3,000 metric tons a year of Rare-Earths from the Mount Weld Mine, beginning late next year.

Sojitz and Lynas aim to increase shipments to more than 9,000 metric tons as year by early 2013.

With half of China's export of REEs going to Japan – about 25,000 metric tons a year – the transaction responds to China having blocked Japan-bound shipments for two months beginning in mid-September after a dispute over islands controlled by Japan but claimed by China.

2014 FORECAST SUPPLY ASSUMPTIONS

SUPPLY SOURCES

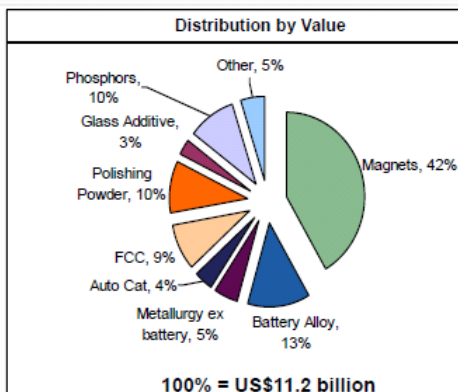
• Baotou	60,000t
• Sichuan	20,000t
• Ionic Clay Regions	30,000t
• Recycling in China	4,000t
China Total	114,000t
• Mount Weld	22,000t
• Mountain Pass	20,000t
• Others (India & Russia)	12,000t
• Recycling outside China	1,800t
Outside China Total	55,800t
Grand Total	169,800t

KEY UNDERLYING ASSUMPTIONS

- Baotou – 10% production increase 2010 / 2014
- Sichuan – full production quota to be utilised
- Ionic Clay – 2010 reduced from 2008 reported levels due to news reports. 2014 reduced to double current production quota (conservative estimate, could be lower)
- Mountain Pass – full production (20,000tpa) achieved
- Recycling – 20% Nd, Pr & Dy recycled from previous year's magnet production (~30% SWARF losses)

2014 GROWTH RATE AND DEMAND FORECAST BY APPLICATION

Application	Growth rate p.a. (%)	Demand (t)
• Magnets	12%	55,100
• Battery Alloy	15%	32,500
• Metallurgy ex batt	2%	12,700
• Auto catalysts	8%	12,200
• FCC	4%	24,900
• Polishing Powder	10%	28,000
• Glass Additives	0%	7,800
• Phosphors	8%	10,800
• Others	8%	6,100
Total	9%	190,100t REO



Source: Lynas Corp

At the end of December 2010, **Bloomberg** launched its **Rare Earth Mineral Resources Index**. This is a “modified market capitalization weighted index” comprising publicly-traded companies with advanced rare-earth projects.

The primary criterion for inclusion in the Index is that a company has a rare-earth project with a defined 43-101- or JORC-compliant mineral resource. The Index will be updated and re-weighted on a quarterly basis, so that companies with new mineral-resource definitions will be eligible for inclusion.

In the first iteration of the Index, Bloomberg chose the following companies and weightings:

Member Companies on the Bloomberg Rare Earth Mineral Resources Index and their weightings (at Dec 21, 2010)

Company	Ticker Symbols	Weighting (%)
Molycorp Inc.	NYSE:MCP	16.4
Lynas Corporation Ltd.	ASX:LYC, PK:LYSCF	15.0
Avalon Rare Metals Inc.	TSX:AVL, AMEX:AVL	11.4
Rare Element Resources Ltd.	TSX.V:RES, AMEX:REE	11.2
Arafura Resources Ltd.	ASX:ARU, PK:ARAFF	10.0
Greenland Minerals and Energy Ltd.	ASX:GGG, PK:GDLNF	6.7
Quest Rare Minerals Ltd.	TSX.V:QRM, PK:QSURD	6.3
Frontier Rare Earths Ltd.	TSX:FRO	5.9
Alkane Resources Ltd.	ASX:ALK, PK:ALKEF	5.0
Tasman Metals Ltd.	TSX.V:TSM, PK:TASXF, F:T61	4.6
Great Western Minerals Group Ltd.	TSX.V:GWG, OTCBB:GWMGF	4.2
Navigator Resources Limited	ASX:NAV	2.1
Matamec Explorations Inc.	TSX.V:MAT, PK:MTCEF	1.2

Differing Rare Earth Distributions Makes Benchmarking difficult

The “Big 5” REOs are key and contribute >50% to RE project revenues for all peers (notably not Molycorp)

	Avg REO price (\$/kg)1	Current REO price (\$/kg)2	Lynas Mt Weld	Molycorp Mtn Pass	Frontier ZC1-C	Frontier ZC1-B	Rare Element Bare Lodge	Arafura Nolans Bore	Frontier ZC1-A	Frontier ZC1	Avalon Nechalacho	Quest Strange Lake
LREO												
Lanthanum	\$12	\$91	2.03%	2.39%	1.17%	0.93%	1.08%	0.55%	0.67%	0.55%	0.21%	0.13%
Cerium	\$10	\$91	3.63%	3.44%	2.04%	1.61%	1.63%	1.33%	1.16%	0.96%	0.46%	0.27%
Praseodymium	\$29	\$136	0.40%	0.30%	0.21%	0.17%	0.14%	0.16%	0.12%	0.10%	0.06%	0.03%
Neodymium	\$30	\$147	1.39%	0.82%	0.73%	0.58%	0.41%	0.59%	0.41%	0.34%	0.23%	0.11%
Samarium	\$8	\$91	0.20%	0.06%	0.11%	0.08%	0.08%	0.07%	0.06%	0.05%	0.05%	0.03%
HREO												
Europium	\$494	\$740	0.05%	0.01%	0.03%	0.02%	0.02%	0.01%	0.02%	0.01%	0.01%	0.00%
Gadolinium	\$13	\$98	0.12%	0.01%	0.07%	0.05%	0.04%	0.03%	0.04%	0.03%	0.05%	0.03%
Terbium	\$515	\$740	0.01%	0.00%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%	0.01%	0.01%
Dysprosium	\$148	\$450	0.05%	0.00%	0.04%	0.03%	0.01%	0.01%	0.02%	0.02%	0.04%	0.04%
Yttrium	\$18	\$106	0.17%	0.00%	0.19%	0.15%	0.03%	0.04%	0.11%	0.09%	0.15%	0.28%
Erbium	\$0	\$0	0.02%	0.00%	0.01%	0.01%	0.00%	0.00%	0.01%	0.01%	0.02%	0.03%
Thulium	\$0	\$0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Ytterbium	\$0	\$0	0.01%	0.00%	0.01%	0.01%	0.00%	0.00%	0.01%	0.00%	0.01%	0.03%
Holmium	\$0	\$0	0.01%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%
Lutetium	\$0	\$0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Grade			8.08%	7.04%	4.62%	3.65%	3.45%	2.79%	2.63%	2.16%	1.30%	1.00%
Big 5 Grade			1.89%	1.13%	1.01%	0.80%	0.59%	0.78%	0.57%	0.47%	0.34%	0.19%

B and C zones have good grades of the “Big 5”

Notes:

- Based on average FOB China prices for 2008 through end 2010. No value is attributed to Holmium, Erbium, Thulium, Ytterbium and Lutetium as these elements have small markets, are typically produced to special order and do not have a regularly published price. Source: Roskill
- Prices from Metal Pages 1 March 2011

Differing rare earth distribution makes benchmarking difficult, thereby not only considering the economic value of the separate size of TREO elements in the total resource, but also the share of higher valued heavy rare earths elements in the total resource. Moreover, companies are using different cut-off grades while deposits can also include other minerals/metals like uranium, base metals and fluoride. Also, potential environment complications should be considered, particularly in case of higher levels of thorium and uranium.

More specifically, comparisons of rare earth projects based on TREO and HREO can be misleading. Some Light REOs are low value, but some are high value and have high demand growth (neodymium and praseodymium). Some Heavy REOs are high value, but many are low value (gadolinium) or are produced in small quantities to special order, so do not have a regular market price holmium (Ho), erbium (Er), terbium (Th), ytterbium (Yb) and lutetium (Lu).

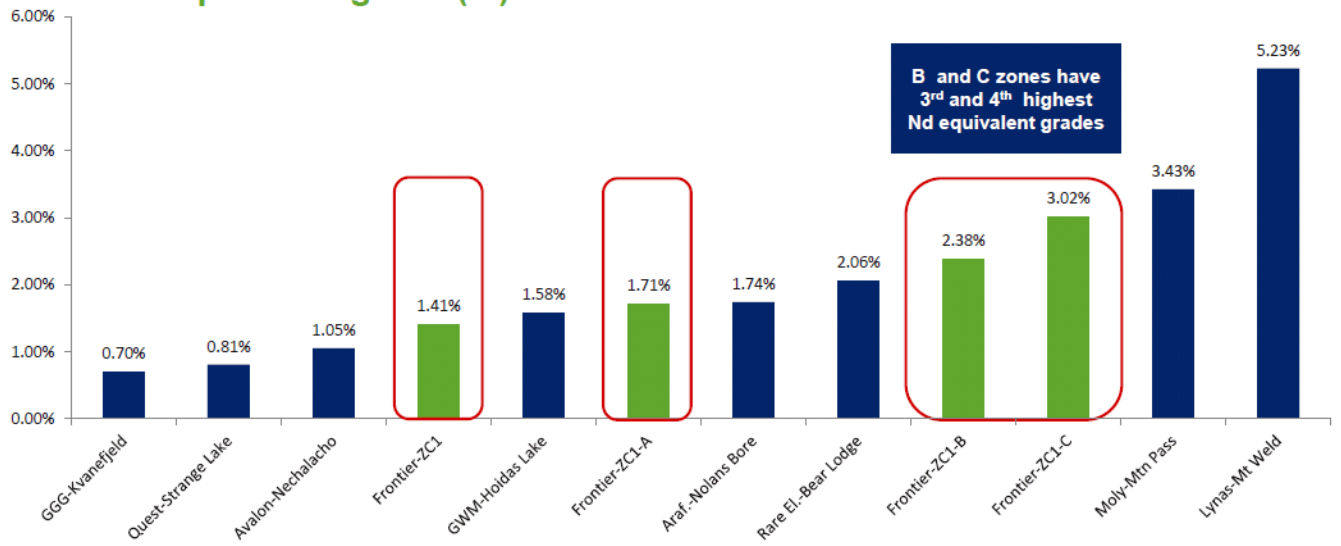
Metal equivalent grade is a better metric as it allows comparisons to be made between multi-commodity deposits containing different distributions of minerals with different values by connecting individual mining grades into a single, dominant mineral grade. This provides for relative ranking of projects.

Metal equivalent grade is widely used measure and common in other multi-commodity deposit environments.

Neodymium (Nd) is proposed as an appropriate REO for which to calculate equivalent grade and using three year average REO pricing data, is the largest or second largest revenue contributor in the majority of Frontier’s peer group. Nd equivalent is a direct proxy for in situ revenue per tonne and this approach is endorsed by the Ontario Securities Commission.

Project Comparison on Metal Equivalent Basis

TREO Nd equivalent grade (%)



Great Western Minerals (GWG – TSX.V), an integrated rare earth producer, has a facility capable of producing rare earth metal alloys for battery production (nickel metal hydride) production in Michigan (US) and a facility producing samarium cobalt and neodymium iron boron magnet “alloys” in the UK.

GWGM holds an option with respect to the former Rare Earths producing **Steenkampsgraal Mine** in South Africa, as well as seven Rare Earth exploration and development properties in North America and plans to bring the Steenkampsgraal mine back to production.

On December 21, 2010, GWGM confirmed that it had made an all-cash offer for 79.2% shares of Rare Earth Extraction, the owner of the Steenkampsgraal Mines, not already held by GWGM.

GWGM is to purchase 37.64 million shares at a price of 3 SA Rand per share.

On April 21, 2011, GWGM announced that it has updated its plans for the Steenkampsgraal Rare Earth Property. The Company has immediate plans to commence refurbishment of the formerly producing mine shaft at the site, re-establish the containment ponds, and address all waste disposal requirements.

The Company will commence work immediately after it receives approval of the proposed work program from the **National Nuclear Regulator of South Africa** (“NNR”) under the site’s existing Nuclear Licence. The receipt of the NNR work program approval will also allow GWGM to proceed immediately with surface and underground sampling at Steenkampsgraal to begin the process of bringing the historic resource estimate into compliance with NI 43-101 technical reporting requirements.

The design of the mine and processing facilities has been upgraded to allow for capacity to produce approximately 12,000 tonnes per annum of Rare Earth chloride solutions. These will be sent to the solvent extraction separation facility, planned to be located to South Africa, to produce approximately 5,000 tonnes of REOs per year.

This planned level of production is almost double the 2,700 tonnes per year capacity originally anticipated.

GWGM has the ambition to be a fully integrated Rare Earths supplier by, or before, the beginning of 2013.



Molycorp Minerals (MCP – NYSE) is the only REO producer in the Western Hemisphere and produces more than 3,000 tonnes of commercial rare earth materials per year since having reopened its **Mountain Pass Mine**, California at rebuilding costs of approximately US\$ 530 million. Since

having discovered rare Earth mineralization (bastinasite) in 1949 at Mountain Pass and production having begun in 1952, the Company produced about 40% of global Rare Earths in 1990. However, in 1998 separation activity suspended due to inability to continue using off-site wastewater evaporation facilities followed by final mining and milling campaigns of bastinasite are compiled and mill tailings impoundment are being closed after 30 years of service.

In 2007, the extraction circuit for neodymium/praseodymium restarted for the first time since 1998, with production having commenced in the fourth quarter.

On September 30, 2009, privately held Molycorp Minerals, successor of Molycorp Inc a wholly owned subsidiary of Chevron, acquired the Mountain Pass facility from Chevron Mining, as a foundation to build an integrated rare earth products and technology company. With processing of stockpiled bastinasite having begun in 2009, mining of fresh bastinasite began in 2011 and is to go full scale by 2012.

Molycorp is presenting the Mountain Pass Mine, a superior Rare Earth ore body both in quality (high-grade) and quantity, containing the most abundant Rare Earth deposit in the Western hemisphere. The Mine is expected to produce high quality REO's including cerium, lanthanum, neodymium, praseodymium and europium.

In June 2010, Molycorp signed a Letter of Intent with **Neo Material Technologies** (NEM – TSX) of Canada, a global producer of neodymium-iron-boron magnetic powders and rare-earth based engineered materials and applications to cooperate in the rare earth "Mine to Magnets" supply chain to their mutual benefit.

In December 2010, Molycorp announced that it had secured the last of several environmental permits necessary to begin construction of its new, \$ 53.1 million state-of-the-art Rare Earths manufacturing facility at Mountain Pass. The construction period is estimated at 18 months. Full capacity is scheduled to occur by the end of 2012.

Also in December 2010, the Company and Sumitomo of Japan agreed to a US\$ 130 million equity and debt investment in Molycorp in exchange for a Rare Earth supply agreement.

On April 4, 2011, Molycorp announced that it had completed the acquisition of a 90% controlling stake in **AS Silmet** of **Estonia**, one of only two rare earth processing facilities in Europe, in a transaction valued at approximately \$ 89 million.

The acquisition provides Molycorp with its first base of operations as well as doubles the Company's current rare earths production capacity from approximately 3,000 tonnes per year REO equivalent to 6,000 tonnes.

Expecting the completion of Phase I of its modernization and expansion efforts at its **Mountain Pass** processing facility, Molycorp expects to produce at a rate of approximately 19,050 tonnes of REO equivalent per year.

Molycorp expects to achieve an annual production capacity by the end of 2013 of approximately 40,000 tonnes of REO equivalent per year after the completion of Phase 2.



Lynas Corp. (LYL – ASX) owns the richest deposit of Rare Earths in the world at **Mount Weld** in Western Australia. A feasibility study has been completed on the Mount Weld Deposit and all Australian approvals required for Project development have been received.

A comprehensive evaluation of the Deposit has been completed by independent specialists Hellman and Schofield, resulting in a substantial upgrade in the resource to 7.7 million tonnes at 12% for 917,000 tonnes REO.

Due to the high ore grades the ore production level is forecast to be relatively small. For example: production of 10,500 tonnes REO in the first year of operations will require 120,000 tonnes of ore to be processed.

With current demand at 95,000 tonnes per annum the Mount Weld production will represent approximately 11% of the global market.

Based on the proposed ore treatment options current reserves were calculated by Australian Mine Design and Development as 2.1 million tonnes @ 15.5% REO containing 321,000 tonnes REO.

This is about 35% of the available resources.

Lynas confidently expects that further ore processing studies and inclusion of lower grade ore will result in a mine life in excess of 20 years.

In November 2009, Lynas completed a A\$ 450 million capital raising to enable the completion of construction of the Concentration Plant at Mount Weld and Lynas Advanced Materials Plant (LAMP) to process the Mount Weld concentrate through the final Rare Earth oxides (REOs) in the Gebeng Industrial Estate, Kuantan, Pahang, Malaysia.

The first feed of ore into the Concentration Plant is on target for the first quarter of 2011.

In November 2010, Lynas signed a Strategic Alliance with Sojitz of Japan to secure additional supply of Rare Earths products for the Japanese market.

Phase I operations are scheduled to begin in the third quarter of 2011, with an initial capacity of 11,000 tonnes REO per annum and the capacity of the LAMP to be doubled to 22,000 tonnes per annum in 2012.

On December 22, 2010, Lynas received approval from the Government of Malawi for the acquisition of the fully permitted Kangankunde Rare Earths Resource. The Company expects to complete the acquisition of this asset within the next few weeks for the contract sum of US\$ 4 million.

The Deposit has an Inferred resource of 107,000 tonnes of REO at an average grade of 4.24% REO using a 3.5% REO cut-off grade.

Rare Earth Oxide	Mt Weld Distribution	2007	2008	2009	Q3 2010	Q4 2010	27/04/11
Lanthanum Oxide	25.50%	3.44	8.71	4.88	23.67	52.49	133.10
Cerium Oxide	46.74%	3.04	4.56	3.88	23.05	52.62	130.60
Neodymium Oxide	18.50%	30.24	31.90	19.12	55.81	81.38	230.00
Praseodymium Oxide	5.32%	29.05	29.48	18.03	54.37	78.62	215.50
Samarium Oxide	2.27%	3.60	5.20	3.40	14.40	36.58	120.60
Dysprosium Oxide	0.124%	89.10	118.49	115.67	281.54	287.85	700.00
Europium Oxide	0.443%	323.90	481.92	492.92	585.31	611.54	1180.00
Terbium Oxide	0.068%	590.40	720.77	361.67	593.38	620.38	1200.00
A.v. Mt Weld Composition		11.59	14.87	10.32	16.02	62.18	160

Note: Mt Weld distribution totals 98.9%, the balance is made up of Gadolinium, Holmium, Erbium and Yttrium oxides. Regular pricing information is not available for these metals.

Source: Lynas Corp.

On March 16, 2011, Lynas announced that it had signed a Master Agreement with Forge Resources for the sale and potential development of the Swan and Crown deposits, being subleases over designated areas within the Mount Weld Mining Lease, but being considered non-core assets of Lynas.

The proposed Forge subleases contain tantalum/niobium and phosphate deposits.

Lynas is to receive A\$ 27 million cash consideration plus an option to acquire up to 7 million ordinary shares in Forge.



Greenland Minerals and Energy (GGG – ASX) has secured to acquire 61%, with options to acquire up to 100% of the **Kvanefjeld Project** on the southwest tip of Greenland

and is recognized as the world's largest undeveloped multi-element occurrence of rare earth oxides, sodium fluoride and uranium.

On March 23, 2010, Greenland Minerals released an updated resource statement confirming Kvanefjeld, at a total of 6.6 million tonnes Total Rare Earth Oxide (TREO), including 350 million pounds of U₃O₈ and 3 billion pounds zinc, to be the largest undeveloped rare earth resource in the world.

The total resource is 619 million tonnes, an increase of 162 million tonnes at 150 ppm U₃O₈ cut-off, consistent with previous resource estimate.

Near surface, higher grade zones were defined, including 122 million tonnes grading 1.4% TREO, 404 ppm U₃O₈.

In 2009, Greenland Minerals' focus has shifted from exploration and resource definition to the requirements of a Pre-Feasibility Study on the Kvanefjeld Project, the results of which were released on February 1, 2010, and provide a Net Present Value (NPV) of US\$ 2.18 billion and calculated a free cash flow of US\$ 8.9 billion over the 23-year mining period, if developed.

A mine processing plant capable of treating 10.8 million tonnes per year is expected to cost US\$ 2.31 billion. Construction is scheduled to commence in 2013 and first production in 2015.

Early indications are that uranium represents approximately 10% of the total in ground value of the Kvanefjeld Deposit, to be estimated at more than US\$ 50 billion.

On May 26, 2010, Greenland Minerals announced that the South Greenland Municipal Council officially supports removal of the current uranium policy of zero tolerance, and ongoing feasibility studies at Kvanefjeld.

The Company aims to commence these work programs in 2011 and work through the definitive feasibility process in close consultation with Greenlandic stakeholders.

On September 10, 2010, Greenland Minerals announced that the Greenland government has introduced an amendment to Standard Terms for Exploration Licences in Greenland. The amendments allow for, upon application approval, the inclusion of radioactive elements as exploitable minerals for the purpose of thorough evaluation and reporting.

Greenland Minerals' application under these regulations has been approved.

Greenland Minerals comments that the resources of the northern Ilimaussaq complex are both extensive and unique providing the potential to produce both light and heavy rare earth products, uranium and zinc concentrates, fluoride compounds and zirconium product.

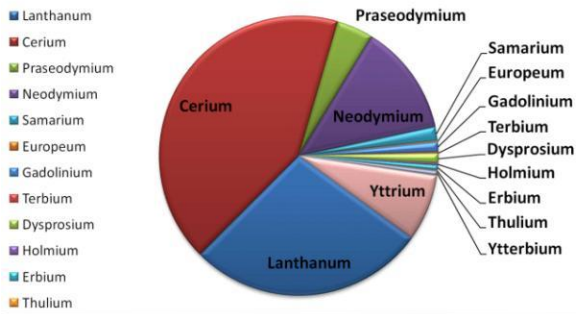
Current metallurgical programs are advancing the process route to produce both a light and heavy rare earth product, including yttrium, uranium and zinc concentrates.

Key beneficiation studies are underway aiming to significantly enhance the Project's efficiency and economics.

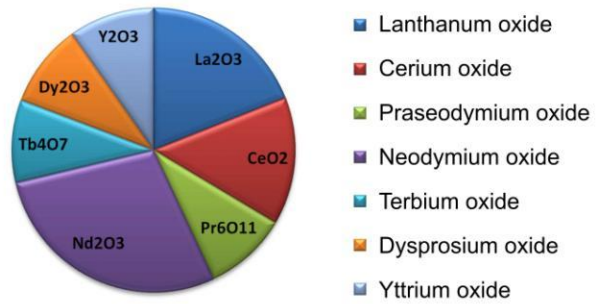
A mine processing plant capable of treating 10.8 million tonnes per year is expected to cost US\$ 2.31 billion. Construction is scheduled to commence in 2013.

Nominal forecast annual production is equivalent to 43,729 tonnes of REO and 3,895 tonnes of U₃O₈. At this level of production Kvanefjeld could potentially supply >20% of the global Rare Earth demand of 2015/2016.

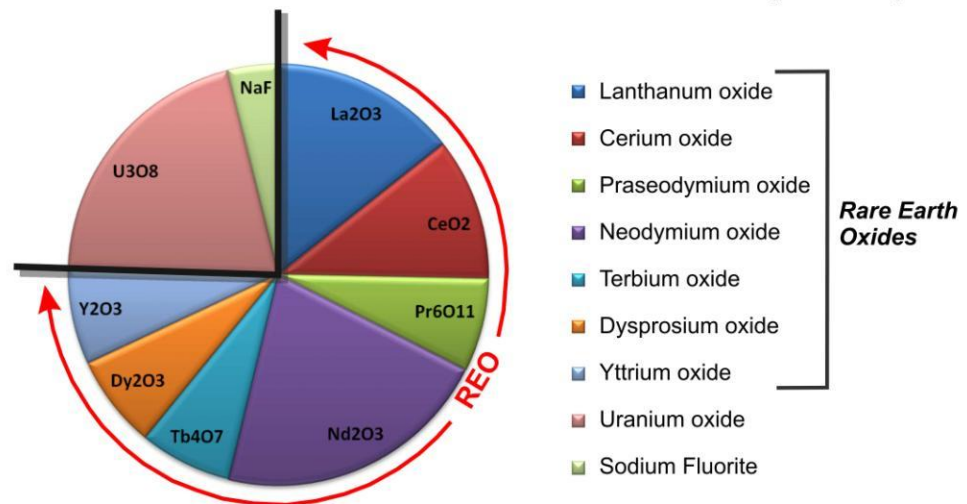
RARE EARTH ELEMENT CONSTITUENTS OF KVANEFJELD ORE



RELATIVE VALUE OF RARE EARTH OXIDE CONSTITUENTS



IN-GROUND VALUE DISTRIBUTION OF KVANEFJELD MULTI-ELEMENT ORE (per tonne)



*Based on REE grades in the geological model and metal prices as of July 08 (IMCOA)

On May 26, 2010, Greenland Minerals announced that the South Greenland Municipal Council officially supports removal of the current uranium policy of zero tolerance, and on ongoing feasibility studies at Kvanefjeld. The Company aims to commence these work programs in 2011 and work through the definitive feasibility process in close consultation with Greenlandic stakeholders. Greenland's labor union (SIK) has backed a change from the current uranium policy to a by-product ruling with a uranium concentration of 0.1%.

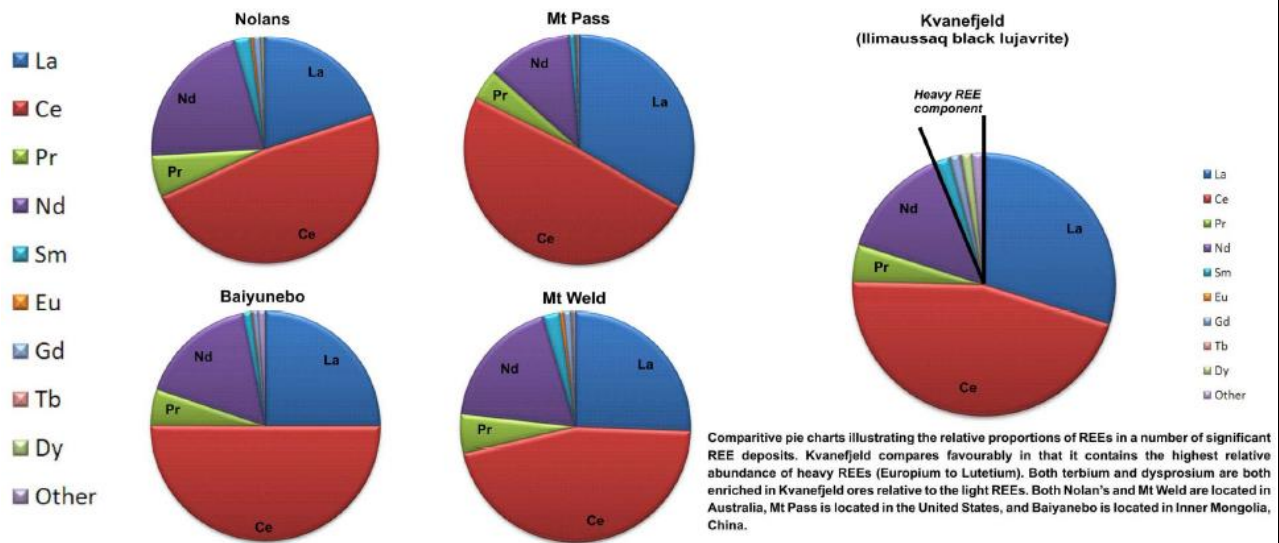
On September 20, 2010, Greenland Minerals announced that the Greenland government has introduced an amendment to Standard Terms of Exploration licences in Greenland. The amendments allow for, upon application, approval, the inclusion of radioactive elements as exploitable minerals for the purpose of thorough evaluation and reporting. Greenland Minerals' application under these regulations has been approved.

On December 4, 2010, Greenland Minerals announced that it has received approval by the government of Greenland to fully evaluate the Kvanefjeld multi-element Project, inclusive of radioactive elements (uranium).

In 2011, Greenland Minerals is planning on closing out the current pre-feasibility study with a final report before commencing a definitive feasibility study in the latter half of the year. Results from the 2010 exploration program will be finalized and announced in early 2011.

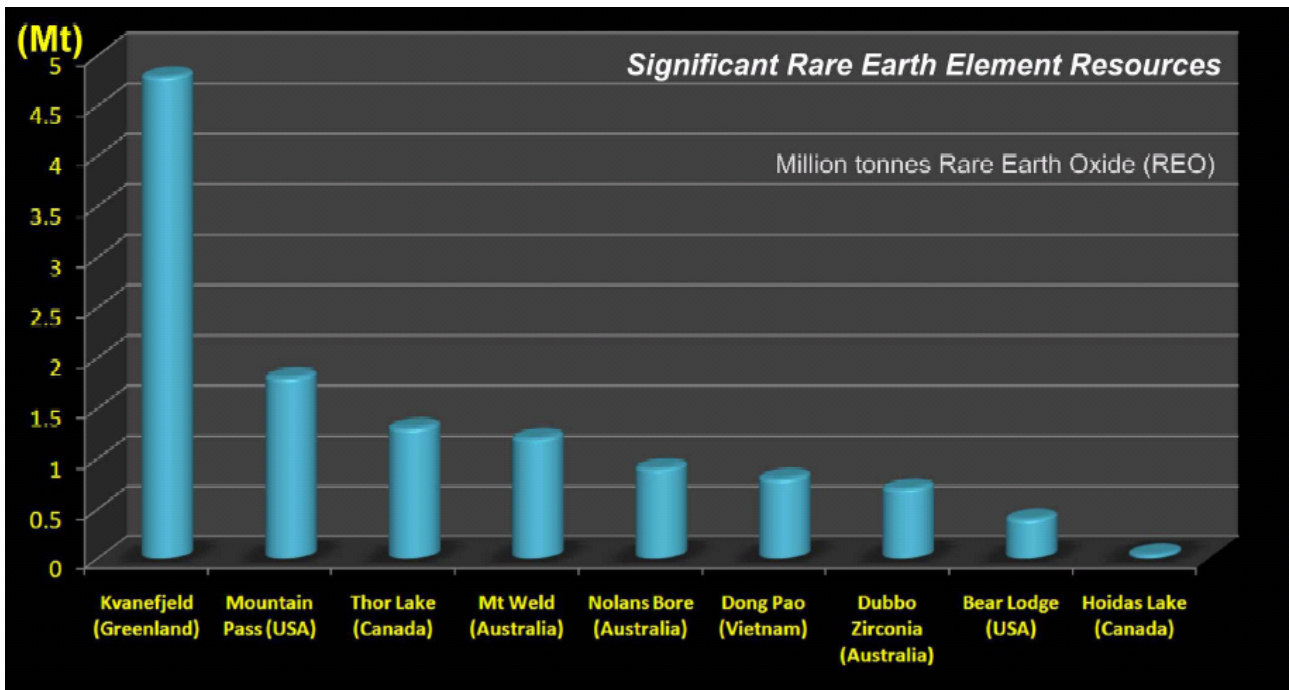
In early July 2010, Greenland Minerals formalized a A\$ 6 million capital raising and established an A\$15 million equity facility that provides the Company with a further A\$ 21 million to fund ongoing work programs on the Kvanefjeld Project.

Relative Abundance of Individual Rare Earth Elements in Select Deposits



Kvanefjeld multi-element ore: Rare earth constituents plus yttrium by percent

La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Y
27.5	42.0	4.2	12.9	1.6	0.1	1.1	0.2	1.1	0.2	0.6	0.1	0.5	7.7





Frontier Rare Earths (FRO – TSX) is a mineral exploration and development exclusively focused on the development of rare earths projects in Southern Africa. Frontier's flagship asset is the **Zandkopsdrift Rare Earth Project**, which is located in the Northern

Cape Province of South Africa and is one of the largest undeveloped rare earth deposits worldwide classified under international resource reporting standards. After Molycorp's Mountain Pass and Lynas' Mount Weld projects, the Zandkopsdrift B Zone has the highest TREO grade and the highest grade of high value HREO's of significant advanced deposits outside China.

In October 2010, Frontier filed a NI 43-101 report on Zandkopsdrift in September 2010 including a resource estimate of circa 43 million tonnes containing approximately 950,000 tonnes TREO (56% in the Indicated Resource category) applying a 1% cut-off.

Frontier's primary objectives are to accelerate evaluation and development of Zandkopsdrift, including the completion of a scoping study in or before the fourth quarter of 2011, a pre-feasibility study by the end of 2011/Q1 2012; and subject to the positive outcome of the pre/feasibility study, completing a bankable feasibility study by the end of 2012; and subject to the results of the bankable feasibility study, commencing production of separated rare earth oxides in 2015.

The Scoping and Pre-feasibility study work programs commenced on schedule in January 2011.

The highest value rare earth oxides, namely europium, terbium and dysprosium, are contained at elevated levels at Zandkopsdrift compared to several other deposits being evaluated elsewhere.

In addition, the low levels of thorium (225 ppm) and uranium (65 ppm) in both absolute and relative terms in Zandkopsdrift compare favourably to many of the more advanced rare earth projects worldwide and reduces the potential environmental complications that would arise in the event of mine development being undertaken at Zandkopsdrift.

Zandkopsdrift's favourable location is expected to provide significant advantages in relation to capital costs, operating costs and development time compared to other rare earth projects currently being evaluated, and makes it well positioned to become one of the first significant new producers of rare earths outside China after Molycorp and Lynas.



Alkane Resources (ALK – ASX) is a multi commodity explorer and miner, focused on the Central West of New South Wales, Australia, about 400 kilometres northwest of Sydney

Alkane's **Dubbo Zirconia Project** (DZP), developments located 30 kilometres south of the large regional centre of Dubbo is one of the world's most advanced zirconium, niobium, yttrium and rare earth productions and is based upon a world class reserve.

A Demonstration Pilot Plant (DPP) has been operating at the laboratory facilities of ANSTO Minerals at Lucas Heights south of Sydney since May 2008 and to date has recovered 1,300 kg of zirconium chemicals and nearly 300 kg of niobium concentrate.

The DPP is currently operating for short periods to trial engineering and process innovations and check specific aspect of the flow sheet for production development.

Laboratory scale testing processed to recover **yttrium** and **heavy rare earths** (**HREE** = gadolinium, terbium, dysprosium and erbium) has been operating within the DPP and about 20 kilograms of filter cake recovered to date. This filter cake has to be further processed to produce a marketable YHREE product and the program to achieve this has commenced

The yttrium and rare earth distribution in the DPZ ore deposit is unusual, having about 25% in the "heavy" category, which is very different to the standard distribution of about 95% light and 5% heavy.

Alkane's light earth program has taken second priority to the yttrium-heavy rare earth recovery and zirconium-zirconia development, but now has increased in importance and it is anticipated that the LREE circuit will be added to the DPP in the December quarter of this year.

The DPP operation has confirmed the process flow sheet and is providing engineering data for capital and operating cost estimates, and continues to generate substantial product for market evaluation. Data from the DPP and Letters of Intent from future customers will be incorporated in the current DFS which should be completed early 2011.

The base case for the development is a 400,000 tonnes per annum ore throughput with all processing facilities located on-site at Toongi, about 30 kilometres south of Dubbo. As a result of expanding markets for all the Project's output, the 1 million tonne per annum ore throughput model will also be considered as par of the DFS and is currently considered to be a likely development concept.

Depending upon financing and Development Consent from the New South Wales State government, the DPZ could be in production late 2012 or early 2013.

Alkane's **Tomingley Gold Project** (TPG) is based on three gold deposits located 14 km north of the Company's Peak Hill Gold Mine. Inferred Mineral resources total 689,000 ounces of gold. A Definitive Feasibility Study (DFS) was completed late 2010.

The base case of the DFS incorporated the current ore reserve and anticipated additional recoverable mineral resources from the open pits and underground mining of over a project life of approximately 7.5 years and will recover 369,261 ounces of gold.

Near Orange, Alkane has a joint venture (ODEJV) with Newmont, which resulted in the discovery in 2006 of a significant gold deposit at McPhillamys within the **Moorilda Project**. In July 2010, an initial resource of Indicated plus Inferred resources containing 2.96 million ounces of gold and 600,000 ounces of copper, was announced.

Newmont is proceeding to complete a Bankable Feasibility Study for the development of the Deposit.



RAM Resources (RMR – ASX) has focused its primary attention to explore the Motzfeldt multi-element Project in southern Greenland. In addition, the Company has some gold and base metal projects in proximity of Newcrest Mining's rich Telfer Mine.

Ram may progressively move to 80% ownership of the project by funding exploration and development to A\$ 25 million over 6 years and the payment of A\$ 3 million in cash. The Company completed the acquisition of the initial 51% and has noticed the exercise of its option, being a further 14%.

The Motzfeldt Project has been explored earlier in the 1980s by the GEUS, which estimated a target of 200-500 million tonnes at an average grade of 1800-2200 ppm Nb₂O₅ and 130 – 160 ppm Ta₂O₅ with potential to outline internal high-grade zones at the Aries Prospect.

Ram's key objectives of the 2011 field program are to generate sufficient data from the proposed drilling to permit the calculation of a maiden JORC compliant Mineral Resource at Aries. Also, the concept of a higher grade REE zone to the west of the drilled area will be further tested. The program includes 16-19 diamond drill holes for approximately 3,500 metres, to test the strike extents of mineralization. Ram will also expand coverage of surface geophysics and geochemical.



Kirrin Resources (KYM – TSX.V) operates two **REE** exploration projects in **Newfoundland & Labrador** and **Quebec** and two **uranium** exploration targets in **Newfoundland & Labrador** and **Saskatchewan, Canada**.

The **Grevet Property** encompasses a carbonatite intrusive body and dyke complex and its acquisition was premised on the potential for an open pit operation. Kirrin believes the Property may have geological similarities to the large **Bayan Obo** REE-bearing carbonatitic body in **Inner Mongolia, China**. Sampling results show up to **14.27% TREO** in a grab sample from a ~2.5 cm wide carbonatite dyke and 1.61% LREO across 2.2 metres from a wider carbonatite dyke. These results confirm the potential of the property to host REE-bearing carbonatite deposits with LREO grades of definite interest. The SIGEOM data bank records that Grevet sample 2010MP64 (58809), which returned 14.27% TREO, is the highest REE value obtained in Québec to date.

Mineralization in the **REO Target Area** at **Bottom Brook** shows a significant enrichment in the light rare earth elements (**LREE, La – Sm**) versus the heavy rare earth elements (**HREE, Eu – Lu**). Intensive exploration has identified 9 REE targets, sampling yielding **14.47% LREO** (including 51% **cerium**, 27% **lanthanum** and 15% **neodymium**), consistent across all samples with >1% TREO. Drilling has intersected multiple zones of mineralization including 4.32% TREO over 2 metres and 1.16% TREO over 15.3 metres. Based on its results to date, Kirrin is hopeful of finding an in-situ resource with per tonne rock values up to \$ 10,000.



Bolero Resources (BRO – TSX.V) Bolero's primary assets include three REE projects: a 100% interest in **206 mineral claims** covering 87,852 hectares in **northern British Columbia** ("BC"), **contiguous to Spectrum Mining's Wicheeda Project**, the **Carbonatite Syndicate** claim group, and the recently acquired **Charge REE Project** which currently contains the highest lanthanum, yttrium and the second highest cerium samples in **BC**.

Moreover, the Company has a 100% interest in 12 quartz claims over 6,500 acres in 2 separate claim blocks in the **White Gold District** in the in the **Yukon** in close proximity to recently announced recoveries by **Kaminak Gold** and **Underworld Resources**; and a 100% interest in the **Red Chris South Copper-Gold Project** in BC, contiguous to **Imperial Metal's Red Chris** copper-gold discovery.

With Cdn\$ 3.7 million in cash, Bolero anticipates a robust 2011 drill/work season for all its prospects.



International Montoro Resources (IMT – TSX.V), "IMT" is focusing on advancing its new **REE** property acquisitions in the **Rocky Mountain Rare Metals Belt** in north-eastern **British Columbia** and its 100%-owned **Elliot Lake**

Uranium Project in northern Ontario, where in **November 2009** also the presence of rare earth elements (REE) was confirmed.

In addition, the Company is continuing development with **Belmont Resources** (50/50) of its **Crackingstone** and **Orbit** uranium properties in the **Uranium City District** in **northern Saskatchewan**.

IMT also holds 100% interest in the **Cup Lake / Donen Uranium Project** in **south-central British Columbia** and two claim blocks (50/50 Belmont) in the **Central Mineral Belt** in **Labrador**.

In **January and February 2010**, the Company acquired a total land package of 2,268 hectares (**Chuchinka Properly**) in **British Columbia**, contiguous to the Wicheeda Project, where in late October 2009 significant rare earth element mineralization was reported.

In **August 2010**, IMT and Belmont entered into an option agreement with **Rare Earth Metals** whereby RA can earn a 75% interest in the **Partridge River Property** in **west-central Labrador**.

Overview of major Rare Earths companies

March 31, 2011	Trading symbol		Share price		Change in %	12 months prices		Net shares issued million	Market cap. million
			current	Ult.2010		H	L		
Rare Earths:									
			US\$	US\$		US\$	US\$		US\$
Molycorp Minerals	MCP	NYSE	60.02	49.90	20	62.80	12.10	82.3	4,939.6
			Cdn\$	Cdn\$		Cdn\$	Cdn\$		Cdn\$
Avalon Rare Metals	AVL	TSX	7.82	6.21	26	8.41	1.89	93.6	732.0
Rare Element Resources	RES	TSX.V	12.73	15.95	-20	17.85	1.94	43.5	553.8
Quest Rare Minerals	QRM	TSX.V	6.00	5.53	8	6.65	1.74	57.3	343.8
Great Western Minerals	GWG	TSX.V	0.82	0.58	41	1.23	0.15	374.8	307.3
Frontier Rare Earths *	FRO	TSX	2.70	3.35	-19	3.75	2.30	89.6	241.9
Stans Energy	RUU	TSX.V	2.08	1.30	60	3.40	0.19	113.5	236.1
Tasman Metals	TSM	TSX.V	4.36	4.40	-1	5.91	0.51	40.5	176.6
Ucore Rare Metals	UCU	TSX.V	0.98	0.67	46	1.28	0.20	147.8	144.8
Commerce Resources	CCE	TSX.V	0.85	0.79	8	1.08	0.21	130.6	111.0
Hudson Resources	HUD	TSX.V	0.97	1.64	-41	1.86	0.46	60.7	58.9
Matamec Explorations 1)	MAT	TSX.V	0.44	0.64	-31	0.70	0.11	116.7	51.3
Pele Mountain Resources 2)	GEM	TSX.V	0.32	0.33	-3	0.69	0.09	133.9	42.8
Midland Exploration	MD	TSX.V	1.75	1.90	-8	2.05	1.20	22.3	39.0
Quantum Rare Earth Dev.	QRE	TSX.V	0.48	0.50	-4	0.72	0.22	80.2	38.5
Eagle Plains Resources	EPL	TSX.V	0.41	0.64	-36	1.28	0.11	82.6	33.9
Rare Earth Metals	RA	TSX.V	0.36	0.40	-10	0.52	0.51	75.7	27.3
Bon Terra Resources	BTR	TSX.V	0.40	0.45	-11	0.71	0.08	59.8	23.9
Silver Spruce Resources 3)	SSE	TSX.V	0.14	0.20	-30	0.36	0.04	106.1	14.9
Bolero Resources * 4)	BRU	TSX.V	0.31	0.52	-40	0.58	0.16	35.3	10.9
Paget Minerals	PGS	TSX.V	0.18	0.21	-14	0.33	0.14	58.1	10.5
Canadian Int. Minerals	CIN	TSX.V	0.21	0.62	-66	0.78	0.13	38.1	8.0
Cache Exploration	CAY	TSX.V	0.33	0.32	3	0.17	0.47	20.0	6.6
Electric Metals	EMI	TSX.V	0.12	0.16	-25	0.26	0.06	45.7	5.5
Kirrin Resources *	KYM	TSX.V	0.11	0.15	-27	0.16	0.04	46.3	5.1
Alix Resources	AIX	TSX.V	0.24	0.22	9	0.68	0.15	17.6	4.2
Int. Montoro Resources *	IMT	TSX.V	0.07	0.14	-50	0.18	0.03	54.4	3.8
			A\$			A\$	A\$		A\$
Lynas	LYC	ASX	2.25	2.06	9	2.35	0.38	1,663.7	3,743.3
Alkane Resources * 5)	ALK	ASX	1.91	1.00	91	1.92	0.23	269.0	513.8
Arafura Resources	ARU	ASX	1.25	1.48	-16	1.79	0.38	367.9	459.9
Greenland Min. and Energy * 6)	GGG	ASX	0.99	1.20	-18	1.41	0.31	317.6	314.4
Navigator Resources 7)	NAV	ASX	0.20	0.22	-9	0.28	0.14	465.5	93.1
Northern Minerals 2)	NTU	ASX	0.55	0.41	34	0.75	0.06	167.7	92.2
Metallica Minerals	MLM	ASX	0.25	0.30	-17	0.37	0.20	125.1	31.3
Gippsland	GIP	ASX	0.05	0.05	0	0.07	0.03	625.1	31.3
Globe Metals and Mining 2)	GBE	ASX	0.30	0.33	-9	0.51	0.12	101.8	30.5
Ram Resources *	RMR	ASX	0.02	0.03	-33	0.06	0.01	546.8	10.9

1) also gold and base metal assets

3) also uranium and gold/silver assets

5) also major gold assets

2) also uranium assets

4) also gold assets

6) also major uranium assets

7) also gold producer in Australia

* featured as Special Situation