

Rare Earth Elements Letter

INTERNATIONAL

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

January 2012 Update

➤ **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.

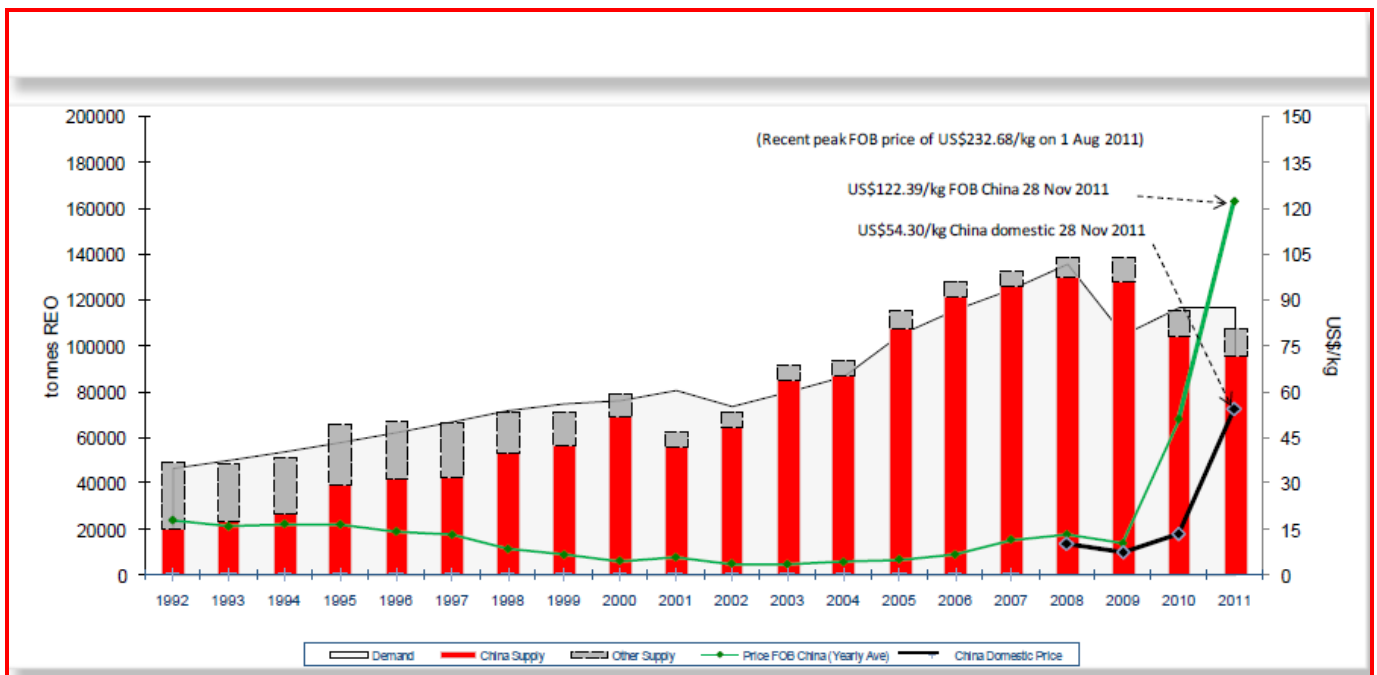
The June 2008 Rare earths price for Lynas' average Mount Weld composition was US\$ 15.22/kg REO on a FOB basis, by June 2009 this dropped to US\$ 9.52/kg REO, a decline of 37%. In the same period the average composition price for China's Baotou Mine declined 40% from US\$ 12.67 to US\$ 7.65/kg REO.

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 more than twenty-folded from US\$ 10.32 at the end of 2009 to a peak of US\$ 232.68/kg as at August 1, 2011 (average Mt Weld Composition – FOB China basis), but interrupted by a sharp correction of approximately 45% to US\$ 103.76/kg as at January 9, 2012.



Source: Industry resources and Lynas research

The table below shows the average annual price for a 'standard 99% purity of individual elements and for the generic composite of Rare earths equivalent to the Rare Earths distribution at Mt Weld. Prices are quoted in US\$/kg on an FOB China basis. Note that higher purity oxides and other value added properties will attract higher prices than those shown.

FOB China Prices

Rare Earth Oxide	Mt Weld Distribution	2009	2010	2011	Q2 2011	Q3 2011	16/01/12
Lanthanum Oxide	25.50%	4.88	22.40	104.10	135.02	117.68	52.00
Cerium Oxide	46.74%	3.88	21.60	102.00	138.29	118.65	45.00
Neodymium Oxide	18.50%	19.12	49.50	234.40	256.15	338.85	200.00
Praseodymium Oxide	5.32%	18.03	48.00	197.30	220.08	344.73	170.00
Samarium Oxide	2.27%	3.40	14.40	103.40	125.60	129.45	80.00
Dysprosium Oxide	0.124%	115.67	231.60	1449.80	921.20	2262.31	1420.00
Europium Oxide	0.443%	492.92	559.80	2842.90	1830.00	4900.00	3800.00
Terbium Oxide	0.068%	361.67	557.80	2334.20	1659.20	3761.54	2820.00
Av. Mt Weld Composition		10.32	31.35	147.96	173.20	193.21	103.76

Source : Metal Pages

China Domestic Prices

Rare Earth Oxide	Mt Weld Distribution	Aug 2011	Sep 2011	Oct 2011	Nov 2011	Dec 2011	Jan 2012
Lanthanum Oxide	25.50%	23.75	20.63	19.78	18.43	16.64	16.67
Cerium Oxide	46.74%	25.00	23.44	22.47	20.47	19.02	18.57
Neodymium Oxide	18.50%	193.75	171.88	151.90	113.39	103.01	98.41
Praseodymium Oxide	5.32%	140.63	134.38	126.58	105.51	88.75	88.89
Samarium Oxide	2.27%	20.78	17.19	15.82	14.96	12.68	12.70
Dysprosium Oxide	0.124%	1562.50	1531.25	1265.82	1039.37	950.87	888.89
Europium Oxide	0.443%	3250.00	2812.50	2531.65	2283.46	1870.05	1825.40
Terbium Oxide	0.068%	2375.00	2265.63	2065.96	1653.54	1584.29	1428.57
Av. Mt Weld Composition		80.34	72.22	65.52	54.30	48.25	46.81

Source : Metal Pages

Supply-demand balance for individual elements

The supply-demand balance is likely to remaining varying considerably over time for individual elements and between light rare earth elements LREEs and heavy rare earth elements HREEs.

An earlier criticality study, based on a combination of importance to the clean energy economy and risk of supply disruption by the US Department of Energy ranked dysprosium as the most critical REE in both the short (0-5 years) and medium term (5-15 years).

Neodymium, terbium and yttrium were ranked next in the short term, followed by europium.

In the medium term neodymium and terbium were ranked below dysprosium, followed by europium and yttrium.

	Demand		Supply/production		Surplus/ deficit
	REO tonnes	%	REO tonnes	%	
Lanthanum	51,050	278.4	54,092	26.5	3,042
Cerium	65,750	36.5	79,156	38.9	13,406
Praseodymium	7,950	4.4	9,909	4.9	1,959
Neodymium	34,900	19.4	33,665	16.5	-1,235
Samarium	1,390	0.8	4,596	2.3	3,206
Europium	815	0.5	659	0.3	-156
Gadolinium	2,300	1.3	3,575	1.8	1,275
Terbium	565	0.3	512	0.2	-53
Dysprosium	2,040	1.1	1,830	0.9	-210
Erbium	940	0.5	1,181	0.6	241
Yttrium	12,100	6.7	12,735	6.3	635
Ho, Tm, Yb, Lu	200	0.1	1,592	0.8	1,392
Total	180,000		203,502	100	

*Forecast supply/demand by element in 2014 (+ 15%)
Those shown in bold are predicted to be in deficit by 2014 (IMCOA 2009)*

EXPORT QUOTA 2011

In 2011, the Government set the REE export quotas at 14,508 tonnes for the first half of the year and 15,738 tonnes for the second half, giving a total of 30,246 tonnes.

Although the export quota for 2011 appears only marginally lower than in 2010, the figures are not directly comparable to the previous years because for the first time these quotas include REE ferro-alloys. It has been suggested that this will result in a 20% net decline in the amount of REE metal and oxide being exported.

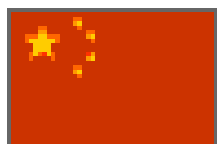
In the first eleven months of 2011 China exported only 14,750 tonnes of REEs or 49% of the full-year limit, leaving a huge amount of export quota not utilized.

Deteriorating end-user demand due to weak economic conditions, high prices and the selling down of stockpiles in China, resulted in a sharp correction of REE prices from a peak of the FOB price of US\$ 232.68/kg on August 1, 2011 to \$ 103.76/kg as at January 9, 2012, as stated by Lynas for its Mount Weld Project.

In order to find a market balance and stop the overall decline of the market, it is expected that China will introduce separate quota for scarcer heavy rare metals, a category that makes up 15% of the overall quota compared with 85% for the relative common light rare earths.

China also imposes export duty on REE leaving the country: Neodymium, yttrium, europium, dysprosium, terbium and scandium have an export tariff rate of 25%, whilst the other REEs have a 15% levy. Dysprosium and neodymium-alloys are subject to a 20% export tariff.

The World Trade Organization (WTO) panel in August 2011 ruled that China had breached international trade rules by restricting exports of magnesium, manganese, silicon carbide and silicon metal. However, Chen Deming, Minister of Commerce, said that he was not concerned about possible WTO challenges to Beijing's policy of Rare Earths.



➤ **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.

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, primarily in response to increasing domestic demand. In 2006, the volume dropped to 48,000 tonnes from a record of more than 65,000 tonnes, in 2007 to 43,574 tonnes, in 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%.

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

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.

► **Restructuring of China's Rare Earths Industry**

In parallel with its trade instruments, China is increasing regulation and consolidation of its REE industry. There has been a trend of closing smaller operations, while emerging larger producers and restructuring mining operators to state-owned companies.

China's Ministry of Land and Resources has cited environmental concerns, protection of finite resources and reduction of illegal mining as the principal reasons for these actions.

It has been recently estimated that as much as 50% of HREE production and 14% of LREE are illegal. In 2006, there were 47 domestic REE producers and traders and 12 Sino-foreign ones which were allowed to export REE products. By 2011, the number had reduced to 22 domestic REE producers and traders and 9 Sino-foreign ones.

China's Ministry for Industry and Trade has consolidated the 35 REE producers in the Inner Mongolia region into a single state-owned company, the Batou Steel Rare Earth, which will handle all mining, processing and trading.

Similar consolidation appears to be happening in the south of China with the establishment of Chinalco Rare Earth Company, counting five smaller plants and one trading firm in the Jiangsu Province.

On November 14, 2011, the Ministry of Industry and Information disclosed independent inspectors to contact illegal exploration, production and import. The findings could have an impact on this year's working plans and quotas.

The Ministry has also indicated that it will not grant any new mining licences for rare earths prospecting before June 2012. Consolidation of the industry is likely to provide the remaining major companies with greater control over pricing and the Chinese government has announced plans to implement a unified pricing mechanism. It is proposed that two of China's largest mining companies will publish a set of price for certain REEs on a monthly basis.

In May 2011, the State Council, China's cabinet, issued a guideline stating that China aims to streamline its Rare Earths Industry within one or two years.

Following this statement, the Chinese Ministry of Industry and Information Technology (MIIT) held a national industry meeting on June 13, 2011 to discuss plans for the industrial restructuring and consolidation. According to Miao Wei, Minister of MIIT, China will create a Rare Earths industrial landscape, dominated by large industrial enterprises, as an effective way to improve the management of the Rare Earths industry.

China will allow its top rare earths producers to lead the restructuring and consolidation in the sector. MIIT said the Inner Mongolia Baotou Steel Rare-Earths (Group) Hi-Tech Co. will be the only Rare Earths producer in the region and will handle all mining processing and trading in Inner Mongolia, the 35 other companies would be restructured or closed down by the end of June 2011.

In addition, there is an overall target to put approximately 80% of China's southern Rare Earths market in the hands of its leading three miners, according to the MIIT.

So far, China Minmetals' Rare Earth arm already owns a combined annual smelting and separating capacity of 14,000 tonnes, the largest in southern China. However, Minmetals itself reportedly does not own rare earths mining rights in the country.

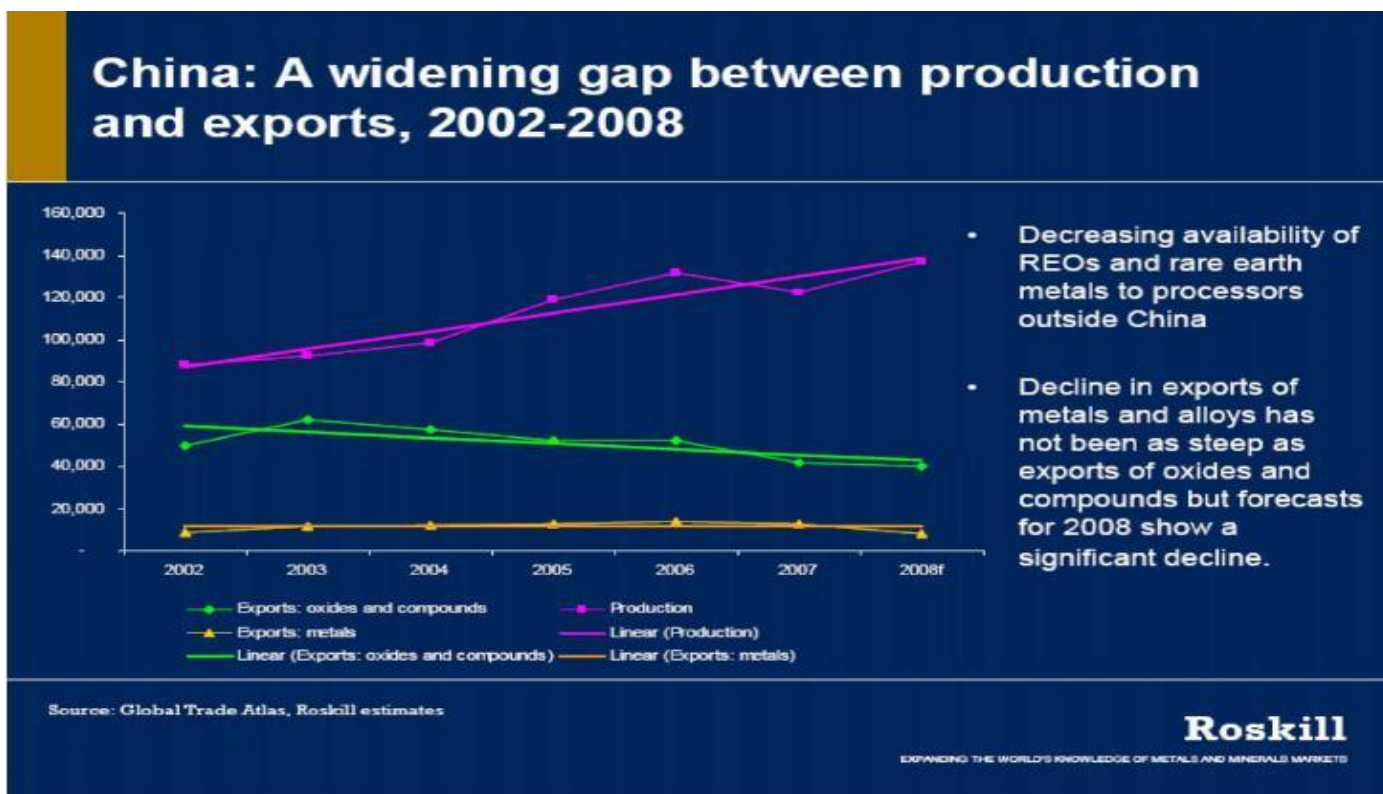
Another State-owned commodity company, the Aluminium Corp. of China (Chinalco), has set up a Rare Earths unit in eastern China's Jiangsu province, and has been playing a leading role in recognizing the local Rare Earths sector in Jiangsu with the support from the provincial government.

Chinalco Rare Earths (Jiangsu) Co. has consolidated 5 local Rare earths separating plants, which has been granted Rare Earths production quotas and one trading company. In addition, it is reported Chinalco is in close partnership with southern China's Guangdong Province for local rare earths mining and production.

➤ **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.

The Company, being listed on the Shanghai Stock Exchange, has a current market capitalization of approximately US\$ 8.7 billion.



➤ **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 is expected to be the next producer, but the pre-operational licence for its Lynas Advanced Material Plant ("LAMP") has been delayed due to an environmental investigation.

Historically the balance of demand and supply in the world rare earth market has been fairly stable. However, in recent years the market has changed substantially from a position of oversupply to demand shortages. Total REO demand in 2008 was 124,000 tonnes, an increase of 45% compared to 2003 when demand was only 85,000 tonnes.

Total demand is predicted to reach 190,000-210,000 tonnes by 2015. Significant growth is forecast in most sectors of REE consumption, particularly for magnets and metal alloys which have a predicted consumption of up to 50,000 tonnes and 55,000 tonnes, respectively by 2015.

China's domestic demand for rare earths is rapidly increasing. It is predicted to be more than 100,000 tonnes by 2015 compared to about 70,000 tonnes in 2010.

With China's domestic supply being restricted as a result of decreasing production quotas and increasing government legislation covering illegal mining, China might become a net importer of heavy rare earths by 2015. This appears to offer plenty of opportunities for new producers in the Western hemisphere.

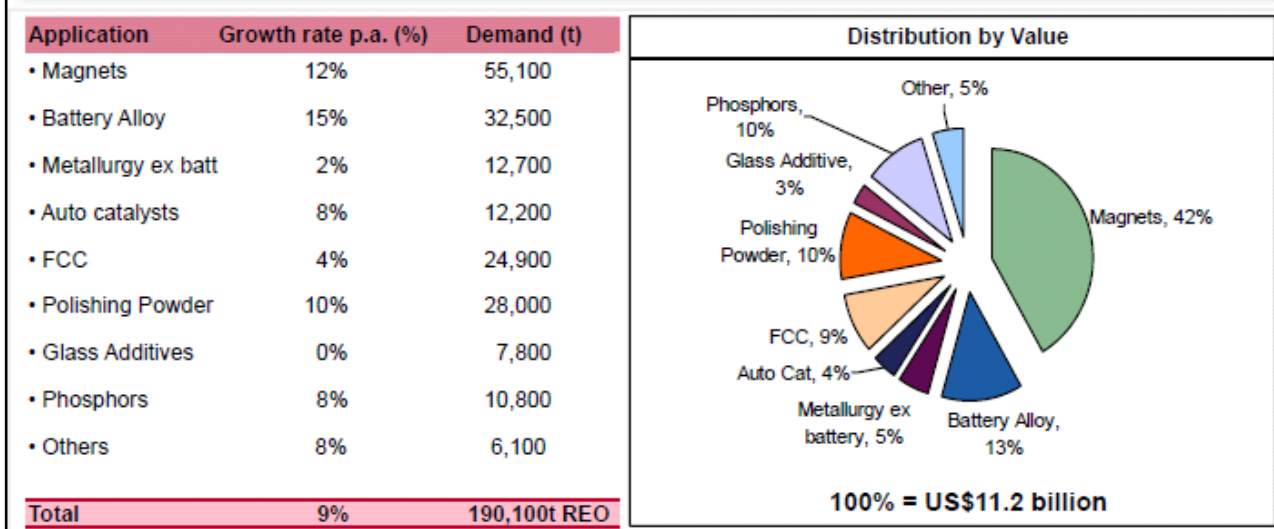
The British Geological Survey projects that total potential new production will increase from just 3,000 tonnes in 2011 outside China - with total production coming from Molycorp's Mountain Pass Deposit - to 129,000 tonnes in 2015, which would be more than 50% of total predicted demand.

Based on company reports new resources are expected to increase further in 2016-17 by 76,500 tonnes, including Greenland Minerals and Energy (44,000 tonnes), Quest Rare Minerals (12,500 tonnes), Avalon Rare Metals (10,000 tonnes) and Rare Element Resources (10,000 tonnes).

Consequently, total projected REO production for the next six years could lead to a position of oversupply again.

2014 FORECAST SUPPLY ASSUMPTIONS		
SUPPLY SOURCES		KEY UNDERLYING ASSUMPTIONS
• Baotou	60,000t	<ul style="list-style-type: none"> • Baotou – 10% production increase 2010 / 2014 • Sichuan – full production quota to be utilised • Iconic 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)
• 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	

2014 GROWTH RATE AND DEMAND FORECAST BY APPLICATION



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.

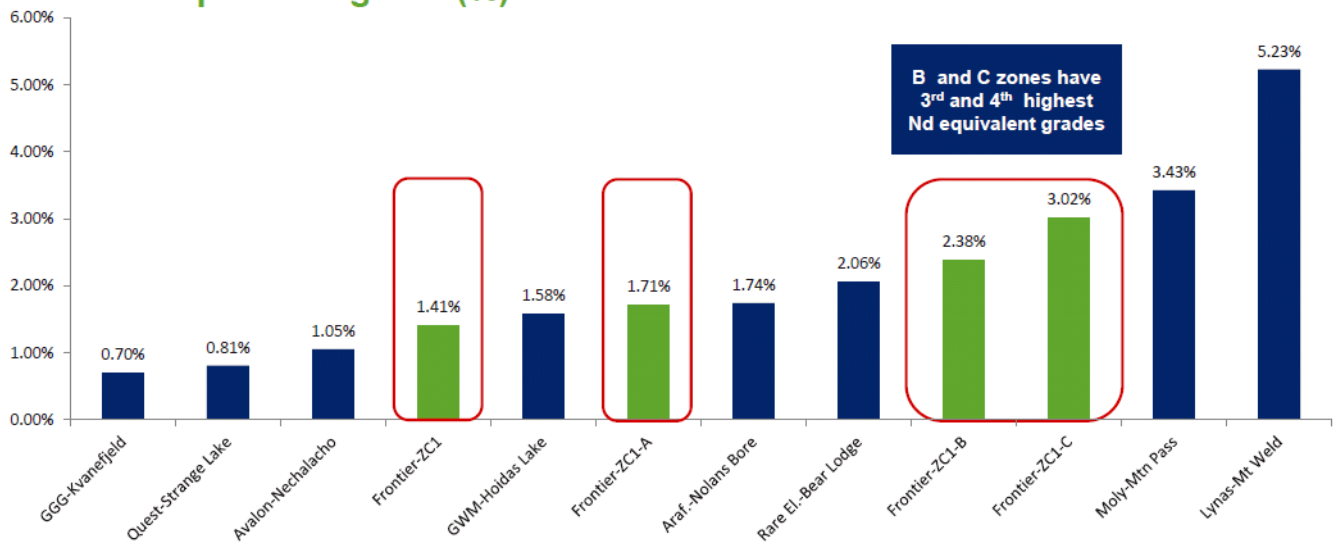
More specifically, comparisons of rare earth projects based on TREO and HREO can be misleading. Some Light REOs are low value, but some are high value and have high demand growth (neodymium and praseodymium). Some Heavy REOs are high value, but many are low value (gadolinium) or are produced in small 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.

GWMG 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.

In July 2011, GWMG completed the acquisition of 100% of Rare Earth Extraction, 74% owner of the Steenkampsgraal Mines.

The Company will commence work immediately after it received 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 GWMG 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, which is expected to be completed by November 2011.

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.

GWMG has the ambition to be a fully integrated Rare Earths supplier by early 2013.

On July 25, 2011, GWMG announced that it had negotiated a Heads of Terms with Ganzhou Qiandong Rare Earth Group of China to build a Rare Earths separation plant in South Africa, located in proximity to GWMG’s Steenkampskraal operation.

A new joint venture company Great Western GQD Rare Earths Materials will be created in which GWMG will hold 75% ownership while GQD will hold the remaining 25%.



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.

Early April 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.

In June 2011, Molycorp announced that it has secured the final funds necessary for the capital build out of its estimated \$ 781 million expansion and modernization project at Mountain Pass with the completion of an offering of \$ 230 million aggregate principal amount of 3.25% Convertible Senior Notes due 2016.

The notes will be convertible at any time into shares of Molycorp's common stock, cash or a combination thereof, at Molycorp's election.

Project Phoenix is now fully funded and on budget for both Phase I and Phase 2, as well as a variety of rare earths metals, alloys, and permanent rare earth magnets.

On January 3, 2012, Molycorp announced that 78% of its Phase I rare earth production (19,050 tonnes) has been secured by signed customer agreements.



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.

Lynas has received a 6-year US\$ 225 million loan from JOGMEC and Sojitz.

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 initially being 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. Production had to be delayed however, due to of a requested review from the Malaysian Government to the Atomic Energy Agency to form an independent expert mission to review the environmental risk of the LAMP project before issuing a pre-operational licence. The mission was completed on June 30, 2011, with the report confirming that the LAMP is safe and fully compliant with international standards.

In December 2010, Lynas received approval from the Government of Malawi for the acquisition of the fully permitted Kangankunde Rare Earths Resource. The contract sum is 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.



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.

On December 5, 2011, Frontier announced that it signed a definitive agreement with **Korea Resources Corp.** ("KORES"), the Korean government-owned mining and natural resources company, to form a strategic partnership designed to accelerate the development of the Zandkopsdrift REE Deposit.



Greenland Minerals and Energy (GMEL")

(GGG – ASX) has secured to acquire 61%, with options to acquire up to 100% of the **Kvanefjeld Project** on the south-

west tip of Greenland and is recognized as the world's largest undeveloped multi-element occurrence of rare earth oxides, uranium and zinc.

In 2009, Greenland Minerals' focus has shifted from exploration and resource definition to the requirements of an interim 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.

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.

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.

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).

On March 23, 2011, Greenland Minerals announced a new JORC-compliant resource estimate being prepared by SRK Consulting which showed an increase of 162 million tonnes to a total resource of 619 million tonnes and an increase of the Indicated resource of 72 million tonnes to 437 million tonnes (at a 150 ppm U3O8 cut-off). The resource includes 350 million pounds U3O8.

The significant improvements in the new estimate can be attributed to further drilling at Kvanefjeld undertaken during the 2009 and 2010 field seasons, the generation of a new geological model and the development by Greenland Minerals in conjunction with SRK of a methodology to domain the unique multi-element resource.

In 2010, regionally drilling confirmed the presence of three other significant multi-element deposits within the broader project area. It is anticipated that the initial resource estimate on Zone 2 and Zone 3, due to be out in early 2012, will serve to increase the overall multi-element base substantially.

On August 2, 2011, Greenland Minerals announced the approval of "Terms of Reference" for Environmental and Social Impact Assessment (EIA and SIA) by the Greenland Government. The EIA and SIA are critical components of a Definitive (Bankable) Feasibility Study in Greenland as set out by its Bureau of Minerals and Petroleum (BMP).
All work programs relay to the EIA and SIA will now proceed to commence the Definitive Feasibility.

On October 29, 2011, Greenland announced a technical breakthrough in the beneficiation of the REE-uranium minerals proposed to be mined at Kvanefjeld. That offers the potential to effectively increase the ore grades by more than 10 times through a simple beneficiation step.

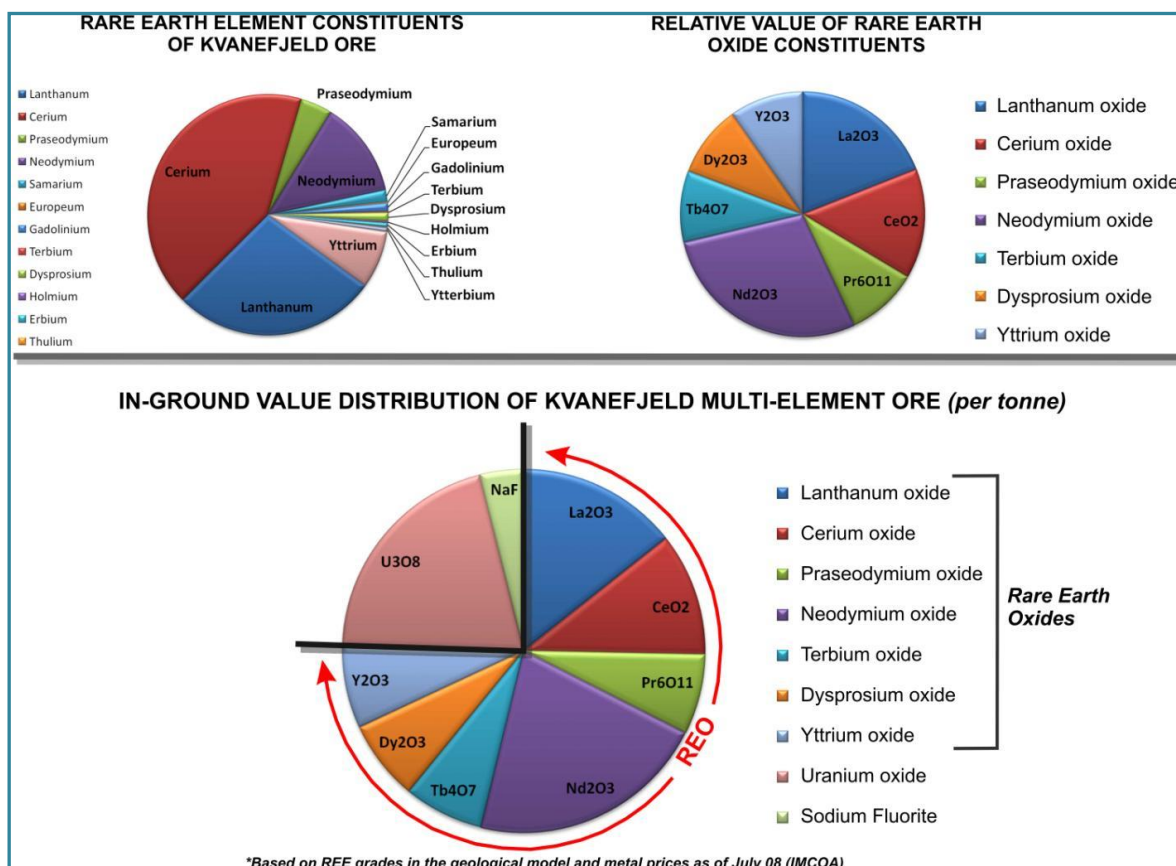
A final go forward flow sheet comparing the base case study and a new alternative scenario through trade-off studies, is expected late in the first quarter of 2012.

The Company's environment and social impact assessments are on track to be completed by late 2012.

The DFS process should be drawing to close in the late second quarter of 2013.

With the cleared geopolitical climate in Greenland having paved the way for the Project to emerge to one of the world's top-5 REE and uranium deposits, in our view, at a current depressed valuation of A\$ 212.4 million, GMEL is one of the world's most undervalued REE/uranium companies.

The Definitive Feasibility Study process should be drawing to close in the late second quarter of 2013.





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.

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 has signed three Memorandums of Understanding (MOUs) for joint ventures to produce zirconium and one MOU to produce niobium, which has ensured that DPZ will be expanded to 1 million tonnes per annum of ore processed.

Revenue estimate or zirconium production is now approximately US\$ 190 million, which represents 39% of annual DOPZ revenue estimates of approximately US\$ 500 million.
The revenue estimate for niobium is approximately US\$ 110 million, which represents approximately 22% of total annual revenue.

MOUs for Heavy rare earths concentrates and Light rare earth concentrates are hoped to be announced around the end of the 2012 March quarter.

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.



NunaMinerals (NUNA – OMX Nordic) projects focus on **Greenland** and offer diversified exponents to a range of precious and strategic metals and are focused on the advancement of two Rare Earth projects, Nanortaluuk gold province, Ymer tungsten, antimony and gold project and Amikoq PGE project.

The Qeqertaasaq (“Q”) and Tikiusaaq (“T”) REE properties are situated in west Greenland. At the Q Property the average of 4 intersects of the Main REE vein is 4.2 metres grading 4.2% TRE.

Phase 2 drilling has been initiated to further test the lateral and down dip continuity of the Main REE vein. At the T Property results from the initial drilling program are expected shortly.

At the Ymer tungsten-antimony-gold property in eastern Greenland, one bulk sample of approximately 400 kg has been collected for metallurgical testing.

At the Amikoq PGE complex two PGE reefs have been identified so far; the Octopus Reef with grades between 0.4 and 1.0 g/t platinum and palladium and the Rhodium Zone grading up to 1.0 g/t platinum, palladium and rhodium.



Kimberley Resources (KYM – ASX) KRE was incorporated by Navigator Resources (ASX:NAV) to be a specialist rare earths company and following listing, now holds a 25% interest in the **Cummins Range Project** in the East Kimberley region, northern Western Australia via a sale agreement with NAV. An additional 30% interest may be earned from NAV with expenditure of A\$ 10 million in exploration over a 4-year period. An additional 25% interest may be earned for a total 80% interest through the completion of a Bankable Feasibility Study.

The Cummins Range Project has a JORC compliant estimated Inferred resource of 4.17 million tonnes at an average of 1.72% TREO for 71,700 tonnes TREO, 11% P2I5 and 187 ppm U3O8 at a cut-off grade of 1%.

The average mix of light rare earths oxides at the Cummins Range Project is comparable to other well known deposits such as the Mt Weld Rare Earth Project, Western Australia owned by Lynas.

According to SRK Consulting, there is a considerable potential to extend the currently known resource and to identify additional mineralization within the Cummins Range carbonatite which will be tested by an aggressive exploration program. The total budget for the first year is A\$ 9.1 million.

By the end of September 2011, KRE announced that it had entered into a Heads of Agreement with Great Western Mining to earn up to a 90% interest in the pegmatite-hosted **Malilongue Project** in western **Mozambique**, with significant exploration potential, including for xeno time-hosted yttrium, dysprosium and erbium.

Historical data include rock chip samples assaying over 20% TREO.



Bolero Resources' (BRU – TSX.V) primary assets include two Rare Earth Element projects: the **Carbonatite Syndicate** claim group consisting of 206 mineral claims covering over 90,000 hectares in northern British Columbia (“BC”), making it the largest land package in the area surrounding significant REE discoveries, and the **Charge REE Project** which currently contains the highest lanthanum, yttrium and the second highest cerium samples in the province of British Columbia, Canada.

Moreover, the Company has a 100% interest in the **Red Chris South Copper-Gold Project** in northern BC, contiguous to Imperial Metal's Red Chris copper-gold discovery and a 100% interest in 12 quartz claims over 6,500 acres in 2 separate claim blocks, located in the **White Gold District** of the Yukon in close proximity to significant discoveries by Kaminak Gold and Underworld Resources that was subsequently taken over by Kinross Gold.

Bolero has completed a robust 2011 drill/work season, and is awaiting assay results from multiple drill programs expected shortly.



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. Sampling results include a remarkable 20.35% LREO (20.41% TREO) in a grab sample from a carbonatite dykelet and 1.61% LREO across 2.2 metres from a wider carbonatite dyke. An additional four samples from other showings assayed >10% LREO and 14 samples ran between 1.0% and 10% LREO.

These results confirm the potential of the Property to host REE-bearing carbonatite deposits with LREO grades of definite interest. The 20.41% TREO grade may be the highest recorded in Quebec.

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) although additional compilation of previous analytical results from drilling and prospecting has defined a substantial HREE component to the Bottom Brook mineralization which consistently gives a HREE/TREO of between 8% and 15%.

Intensive sampling yielded 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.



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

After having completed an initial 51% of the Motzfeldt Project in October 2010, Ram and the Vendors signed formal agreements on the option to acquire the remaining 49% interest in one stage.

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 Nb_2O_5 and 130 – 160 ppm Ta_2O_5 with potential to outline internal high-grade zones at the Aries Prospect.

The focus of Ram's successfully completed 2011 drilling program focused on the Aries Prospect confirms high-grades of potentially economic interest for niobium, tantalum and REEs in all 4 drill holes of 7 drill holes analysed to date.

Finalised results of drill cores should be available at the end of this month with all of the data then to be used for estimation of the initial Mineral resource estimate for the Aries Prospect.

The world's top-10 REE companies (by market capitalization)

Company	Name project	Country project	Estimated annual production target (in tonnes)	From year	Market cap. (US\$ mln.)
<i>Year-end 2011</i>					
Molycorp	Mountain Pass	US	19,000	2012 x	2,011
Lynas	Mt Weld	Australia	11,000	2012 xx	1,799
Avalon Rare Metals	Nechalacho	Canada	10,000	2017	249
Alkane Resources 1)	Dubbo	Australia	10,000	2014	245
Greenland Minerals and Energy	Kvanefjeld	Greenland	44,000	2016	192
Great Western Minerals 2)	Steenkampskraal	South Africa	5,000	2013	159
Rare Element Resources 1)	Bear Lodge	US	10,000	2016	146
Quest Rare Minerals	Strange Lake	Canada	12,550	2017	137
Arafura Resources	Nolans Bore	Australia	20,000	2017	136
Frontier Rare Earths	Zandkopsdrift	South Africa	20,000	2016	76
Top ten total			161,550		5,150

1) also major gold assets

x 40,000 (2014)

2) integrated RE producer

xx 22,000 (2013)

Overview of major Rare Earths companies

		Trading symbol		Share price		Change in %	12 months prices		Net shares issued million	Market cap. million
				Year-end 2011	Year-end 2010		H	L		
December 31, 2011										
Rare Earths:										
				US\$	US\$		US\$	US\$		US\$
Molycorp Minerals	MCP	NYSE		49.90	-100	79.16	26.68	83.9	0.0	
Texas Rare Earths Resources	TRER	OTCQB		3.25	-100	10.00	1.50	34.6	0.0	
				Cdn\$	Cdn\$		Cdn\$	Cdn\$		Cdn\$
Avalon Rare Metals	AVL	TSX		2.41	-61	9.65	2.41	103.2	248.7	
Great Western Minerals	GWG	TSX.V		0.41	-29	1.23	0.39	388.9	159.4	
Rare Element Resources	RES	TSX.V		3.30	-79	17.85	3.16	44.1	145.5	
Quest Rare Minerals	QRM	TSX.V		2.22	-60	8.88	1.75	61.7	137.0	
Stans Energy	HRE	TSX.V		0.72	-45	3.40	0.52	138.5	99.7	
Frontier Rare Earths *	FRO	TSX		0.85	-75	3.70	0.80	89.6	76.2	
Tasman Metals	TSM	TSX.V		1.58	-64	5.98	1.38	42.1	66.5	
Ucore Rare Metals	UCU	TSX.V		0.35	-48	1.28	0.34	151.4	53.0	
Matamec Explorations	1) MAT	TSX.V		0.38	-41	0.70	0.20	120.0	45.6	
Commerce Resources	CCE	TSX.V		0.31	-61	1.08	0.21	130.6	40.5	
Hudson Resources	HUD	TSX.V		0.46	-72	1.86	0.40	80.2	36.9	
Midland Exploration	MD	TSX.V		1.31	-31	2.05	1.31	23.8	31.2	
Namibia Rare Earths	8) NRE	TSX.V		0.40	-50	0.87	0.37	77.8	31.1	
Eagle Plains Resources	EPL	TSX.V		0.23	-64	0.79	0.21	83.2	19.1	
Pele Mountain Resources	2) GEM	TSX.V		0.12	-64	0.69	0.12	149.0	17.9	
Quantum Rare Earth Dev.	QRE	TSX.V		0.15	-70	0.72	0.11	85.9	12.9	
Bon Terra Resources	BTR	TSX.V		0.18	-60	0.59	0.16	68.7	12.4	
Rare Earth Metals	RA	TSX.V		0.11	-73	0.50	0.08	79.5	8.7	
Silver Spruce Resources	3) SSE	TSX.V		0.08	-60	0.36	0.05	106.6	8.5	
Paget Minerals	PGS	TSX.V		0.09	-57	0.35	0.08	68.0	6.1	
Bolero Resources *	4) BRU	TSX.V		0.11	-79	0.58	0.10	38.6	4.2	
Canadian Int. Minerals	CIN	TSX.V		0.05	-92	0.74	0.04	71.4	3.6	
Alix Resources	AIX	TSX.V		0.11	-50	0.30	0.08	26.4	2.9	
Int. Montoro Resources	IMT	TSX.V		0.05	-64	0.18	0.04	56.3	2.8	
Electric Metals	EMI	TSX.V		0.04	-75	0.20	0.04	48.0	1.9	
Kirrin Resources *	KYM	TSX.V		0.04	-73	0.16	0.03	46.5	1.9	
Cache Exploration	CAY	TSX.V		0.08	-75	0.45	0.06	22.3	1.8	
				A\$		A\$	A\$		A\$	
Lynas	LYC	ASX		1.05	-49	2.70	0.86	1,713.9	1,799.6	
Alkane Resources *	5) ALK	ASX		0.91	-9	2.73	0.89	269.0	244.8	
Greenland Min. and Energy *	6) GGG	ASX		0.46	-62	1.41	0.41	416.4	191.5	
Arafura Resources	ARU	ASX		0.37	-75	1.75	0.34	368.0	136.2	
Northern Minerals	2) NTU	ASX		0.38	-7	1.08	0.36	175.5	66.7	
Metallica Minerals	MLM	ASX		0.27	-10	0.52	0.22	140.3	37.9	
Globe Metals and Mining	2) GBE	ASX		0.14	-58	0.37	0.13	223.9	31.3	
Gippsland x	GIP	ASX		0.02	-60	0.06	0.01	812.7	16.3	
Kimberley Rare Earths *	7) KRE	ASX		0.08	-60	0.24	0.08	126.6	10.1	
Hastings Rare Metals	HAS	ASX		0.13	-65	0.42	0.10	71.4	9.3	
Ram Resources *	RMR	ASX		0.004	-87	0.03	0.00	954.9	3.8	
				DK	DK	DK	DK		US\$	
NunaMinerals *	NUNA	OMX- Copenhagen		120.00	126.00 9)	-5	320.00	120.00	1.3	28.0

1) also gold and base metal assets

2) also uranium assets

3) also uranium and gold/silver assets

4) also gold assets

5) also major gold assets

6) also major uranium assets

7) listed as at May 18, 2011

8) listed as at April 14, 2011

9) price/featured as at December 15, 2011

* featured as Special Situation

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A vertical collage of five small images on the right side of the poster, showing various scenes related to commodity trading and finance, such as a person at a desk, a hand holding a document, and a person in a suit.

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A golden dragon sculpture, a traditional symbol of good fortune and power in Chinese culture, positioned on the right side of the banner.An image on the left showing a hand holding a gold coin over an oil barrel, with the text "Oil" on the barrel and "Real Value." below it.

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