



CAMPYK
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**RESEARCH & KNOWLEDGE
MANAGEMENT**



MINING INDUSTRY & TRENDS

MARCH 2017

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1. Key highlights

- In 2016, growth in the production of most mineral commodities in Kazakhstan was mixed. Uranium production in 2016 is estimated at 24,000 tons, which was 1.7% higher YoY. In 2017, the uranium production is expected to decline by about 8% or 2,000 tons due to weak market conditions triggered mostly by a global oversupply. This represents about 3% of the total global output. The production would pick up pace once market conditions improve. Kazakh zinc production declined due to lower zinc in concentrate as mining at some fields moves through a low zinc grade zone and due to maintenance works. Gold production in Kazakhstan continue to increase on the back of rising gold purchases by the central bank.

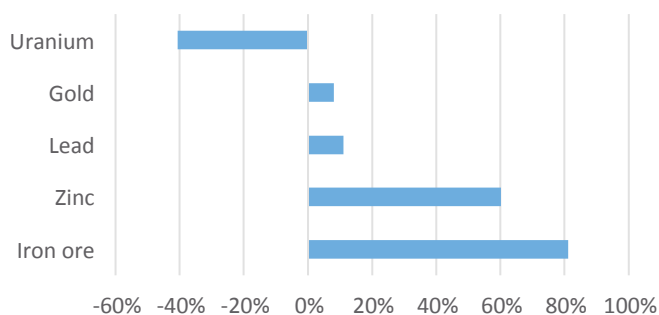
Map of underground resources in Kazakhstan



Source: Kazgeology

- Uranium spot prices fell to USD17.75lb as at end-November 2016, their lowest level since February 2005 and recovered to around USD20lb by end-2016, as oversupply remained intact. Zinc was the second best performing base metal in 2016. Zinc price rally was driven by supply dynamics, while demand rose due to galvanized steel, as a result of stronger infrastructure and real estate demand in China. Lead posted the least-impressive gain among base metals in 2016. Lead prices are still limited by competition from newer, better technologies such as lithium. Iron ore prices have rallied in 2016 as consumption in China proved resilient. Gold had a strong performance in 2016, rising by 8% in USD terms and amassing multi-year record inflows through physically-backed gold ETF.

Key commodities performance in 2016, YoY %



Source: Bloomberg, Samruk-Kazyna

- The uranium market is expected to remain well-supplied through 2020. As a result of this, spot prices are projected to stay moderate at the range USD30/lbs. The uranium market is seen to be potentially volatile owing to both politics and economics. However, there are several price supporting factors, such as major American and European nuclear reactors are coming off supply in 2017 and 2018 and will be looking for long-term contracts once again. In the long-term, uranium market will benefit from strong global nuclear growth, as 58 reactors are under construction.

Annual uranium demand, mln pounds



Source: WNA, "Harmony – The role of nuclear energy meeting electricity needs in the 2 degree scenario"

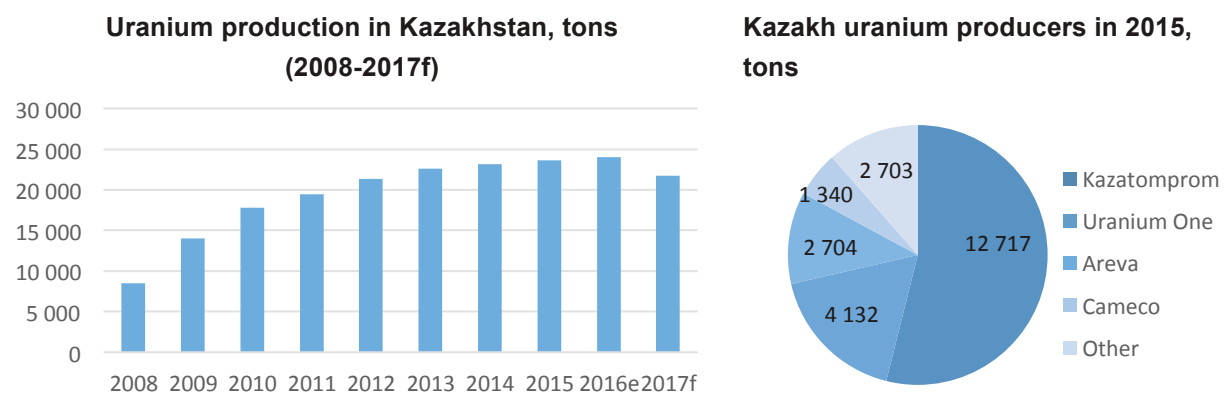
- Zinc market is one of the least consolidated metal markets. Zinc supply growth is weak as almost no miner has a strategic focus on the metal. In 2017, supply might recover in response to higher prices, particularly Glencore will likely to ramp-up its mines again. In general, we expect a tougher market environment with increased competition around the globe. However, the outlook for zinc and lead markets is constructive, supported by solid Chinese macroeconomic data and brighter prospects of US infrastructure spending. Zinc prices are expected to hover around USD2,700-2,800/mt zone on the back of deficit in the market.
- The iron ore market is driven by demand for steel, which in turn is linked to developments in the global economy and its growth. The supply source of iron ore is concentrated, the market share is condensed. Iron ore prices have been stronger than expected, although we continue to expect supply to grow more quickly than demand in the near term. Overall, we believe significant product cuts are unlikely and therefore we do not see the surplus in the iron market abating any time soon. As a result, prices will have to fall in order the market to balance.
- In the short-term, gold price is likely to come under pressure as we approach the rate hike in 2017. Political uncertainty is also a key influence, increasingly in Europe, where 2017 brings the prospect of elections in France, Germany, the Netherlands and, possibly, Italy. The forecast reduction in global mine output and a gradual recovery in demand will see the physical surplus fall in 2017 but remain high. The gold market and future price moves will remain highly reliant on sentiment-driven factors, at least in the short term. Gold prices are expected to hover around USD1,200-1,350/oz in 2017.

2. Uranium

2.1 Production in Kazakhstan

Since 2009, Kazakhstan has been the top uranium producer in the world and is expected to be the dominant producer to 2020. In 2015, its share in global uranium production from mines was at 39%. The country's uranium output increased by 2% YoY to 23,595 tons, with the share of the national uranium mining company, Kazatomprom, in the total production at 54%. The production in 2016 is estimated at 24,000 tons. In January, Kazatomprom highlighted that production would be reduced by about 8% or 2,000 tons, due to weak market conditions triggered mostly by a global oversupply. This is about 3% of the total global output. The production would pick up pace once market conditions improve. The exact change in production levels varies by mine, which includes joint ventures with Cameco's Inkai mine that was expected to produce 5.8mln pounds this year prior to today's announcement.

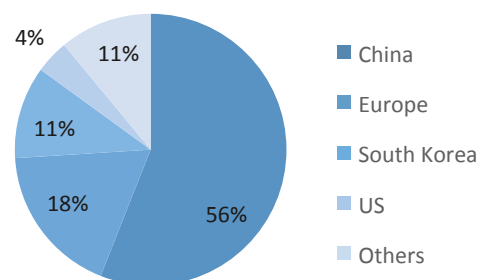
The uranium deposits are explored either solely by Kazatomprom, or through the joint ventures established with the industry's major players. In 2015, Uranium One accounted for 18% of domestic output, while Areva (11%) and Cameco (6%) closed the top four.



Source: WNA, companies' data, Samruk-Kazyna

All of the produced uranium is exported, primarily under long-term contracts, as Kazakhstan does not presently possess nuclear power generation capacity. The country is expanding exports as rapidly as it can grow production. China is the largest importer of Kazakhstan's uranium and accounts for over half of total exports (56%).

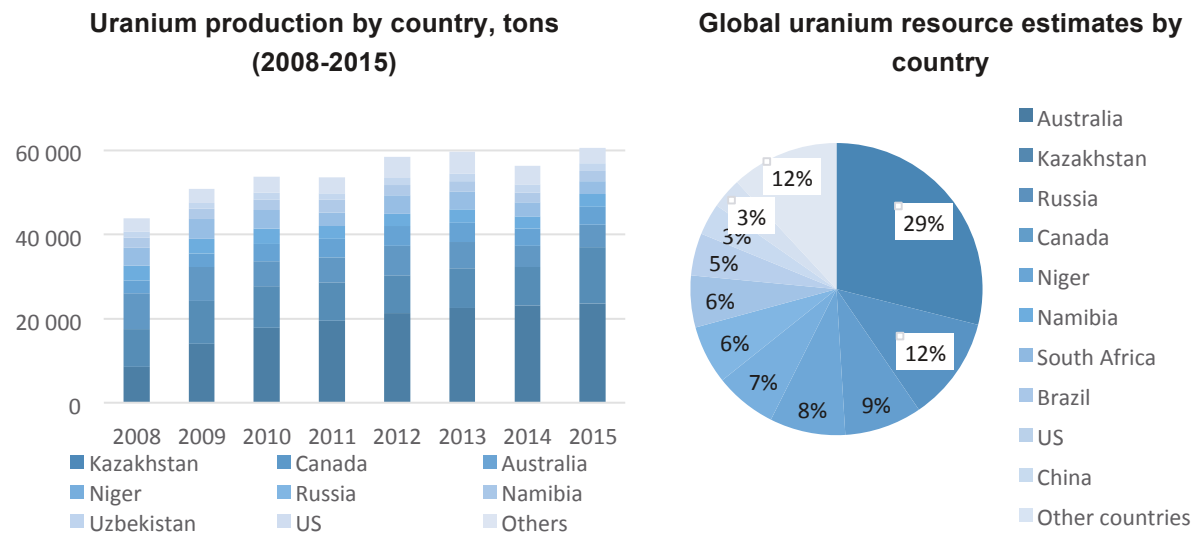
Kazakh uranium export routes



Source: National energy report 2015, Samruk-Kazyna

2.2. World uranium supply

Canada and Australia produce the largest share of uranium from mines (22% and 9% of world supply in 2015, respectively), following Kazakhstan (39%). In 2015, uranium mines supplied some 71,000 tons of uranium oxide concentrate, which contains 60,496 tons of uranium. The uranium supply also comes from secondary sources including stockpiled uranium held by utilities. During the last few years of low prices, those civil stockpiles have been built up and is estimated at about 100,000 tons in Europe, 74,000 tons in China and 45,000 tons in the rest of East Asia.



Source: WNA, *Uranium 2014: Resources, Production and Demand ("Red Book")*, Samruk-Kazyna

In 2015, 46% of world production came from underground mines. In situ leach (ISL) mining has been steadily increasing its share to 48%. ISL uranium production has been established as an important segment of the nuclear industry. Indeed, it is expected to account for almost 50% of world production during the next few years. In the longer term, however, it seems that this share may decrease as more high grade deposits in Canada and additional low grade heap leach deposits in Africa could be brought into production. ISL is expected to be a very significant component of world uranium production for the foreseeable future.

Uranium production breakdown by method

Method	tons U	%
In situ leach (ISL)	29,197	48%
Underground & open pit*	27,791	46%
By-product*	3,507	6%

* Considering Olympic Dam as by-product rather than in underground category

Source: WNA

Largest uranium mines in 2015

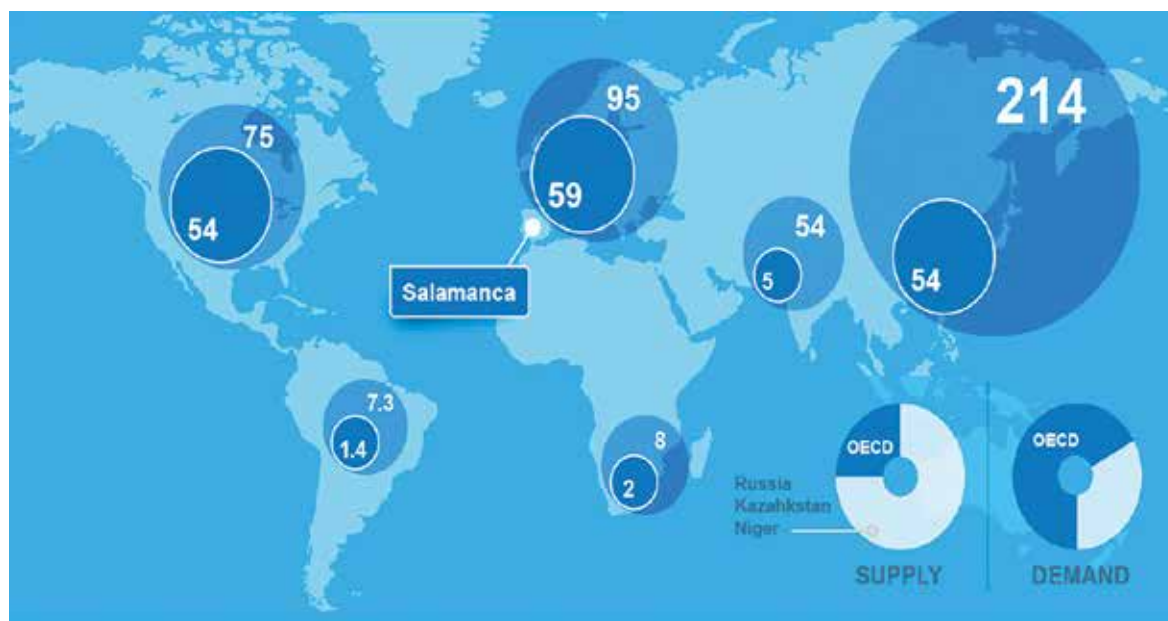
Mine	Country	Main owner	Type	Production (tons)	% of world
McArthur River	Canada	Cameco (69.8%)	underground	7,354	12
Cigar Lake	Canada	Cameco (50%)	underground	4,345	7
Tortkuduk & Myunkum	Kazakhstan	Katco JV/Areva	ISL	4,109	7
Olympic Dam	Australia	BHP Billiton	underground	3,161	5
SOMAIR	Niger	Areva (63.6%)	open pit	2,509	4
Inkai	Kazakhstan	Inkai JV/Cameco	ISL	2,234	4
Budenovskoye 2	Kazakhstan	Karatau JV/Kazatomprom-Uranium One	ISL	2,061	4
South Inkai	Kazakhstan	Betpak Dala JV/Uranium One	ISL	2,055	3
Priargunsky	Russia	ARMZ	underground	1,977	3
Langer Heinrich	Namibia	Paladin	open pit	1,937	3
Central Mynkuduk	Kazakhstan	Ken Dala JSC/ Kazatomprom	ISL	1,847	3
Ranger	Australia	Rio Tinto (68%)	open pit	1,700	3
Budenovskoye 1, 3 & 4	Kazakhstan	Akbastau JV/Kazatomprom-Uranium One	ISL	1,642	3
Rabbit Lake	Canada	Cameco	underground	1,621	3
COMINAK	Niger	Areva (34%)	underground	1,607	3
Top 15 total				40,159	66.4

Source: WNA

2.3 World uranium demand

Currently, 439 nuclear reactors generate demand for uranium, with a total net installed electricity capacity of 380 GW. In 2015, 28% of global demand was from the US, which remained stable compared to 2014. China and South Korea accounted for 12% and 8% of global uranium demand.

Annual uranium demand, mln pounds



Source: WNA, "Harmony – The role of nuclear energy meeting electricity needs in the 2 degree scenario"

World uranium consumption is projected to grow at an average annual rate of 4.8% from 2015 and to total 97 900 tons of U3O8 in 2020. This growth will come primarily from emerging, highly populated economies whose energy policies are embracing nuclear power to provide low carbon electricity that can support their growing industrial base.

The new reactors are mostly in developing markets where demand for power is growing quickly, like China and India. More important, the opening of new reactors is expected to more than offset demand declines from reactors being deactivated. That, in turn, will help to correct the supply-demand imbalance.

China is currently spending USD570bln targeting 10% of its electricity generation from nuclear. From 2018, EU and US utilities will be re-contracting at the same time as China is building 20 new reactors.

Nuclear plants in China



Source: “Nuclear Power: A Growing Future”, the Economist

The world’s overall nuclear generation capacity is expected to increase. More specifically the OECD projects a net increase in global capacity from the current capacity of 379 GW to 400 GW by 2035 in low demand scenario and up to 680 GW in the high demand scenario. This will result in an increase of reactors’ demand for uranium to 72Mt and 122Mt tons under the respective scenarios.

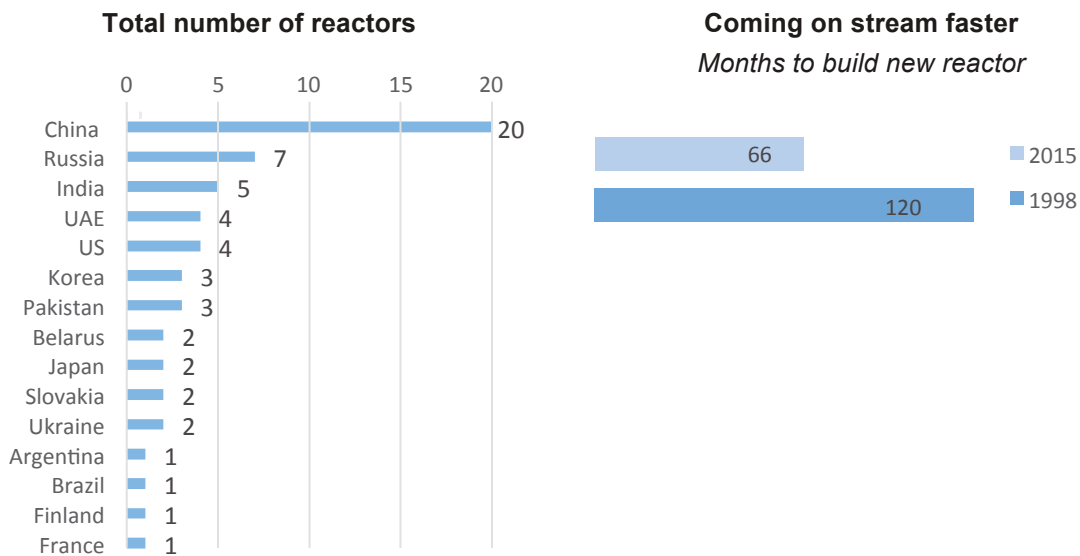
The OECD projections are lower than those offered by the International Atomic Energy Agency (IAEA). Global capacity is expected to reach 400 GW by 2030, 5 year earlier than the OECD forecast. The largest increase in regional generation capacity projected by the OECD is for East Asia, where new capacities of between 57GW and 125GW are projected to be installed. In contrast, in North America and the EU, nuclear generation capacity is expected to decrease slightly depending on the rate of decommissioning reactors, which are nearing the end of project lifetimes.

World nuclear reactors and uranium requirements

Country	Nuclear electricity generation bln kWh	Reactors operable, MWe net	Reactors under construction, MWe gross	Reactors planned, MWe gross	Reactors proposed, MWe gross	Uranium demand, tons
US	799	99,535	5,000	8,312	26,000	18,161
France	419	63,130	1,750	0	1,750	9,211
China	161	31,617	24,166	45,700	156,000	5,338
Russia	183	26,865	5,904	27,755	22,800	6,264
South Korea	157	23,017	4,200	11,600	0	5,013
Japan	4.3	40,480	2,756	12,947	4,145	680
Others	717.7	106,742	20,724	64,530	180,605	18,737
Total	2,411	378,995	70,107	186,704	364,920	66,883

Source: WNA as of 1/1/2017, Samruk-Kazyna

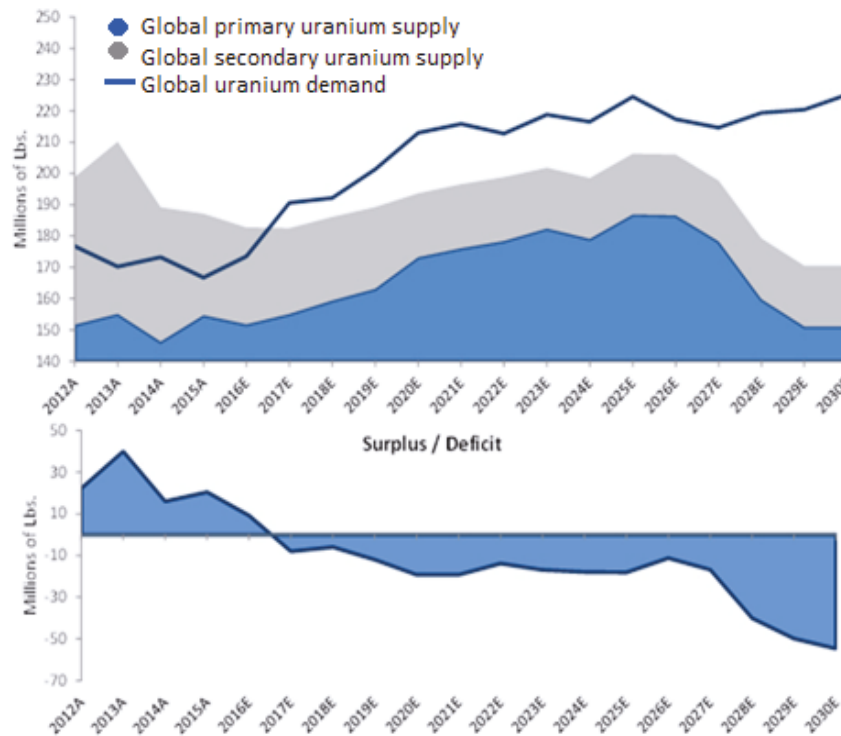
In the long-term, uranium market will benefit from strong global nuclear growth, as 58 reactors are under construction and 512 reactors ordered and planned. 23 of Japanese reactors are in process of restarting, while in 2016, the US started first new reactor in 20 years and four more are under construction. It will take time before the reactors have any kind of impact on the uranium industry, but it is hopeful nonetheless.



Source: WNA

The uranium market is seen to be potentially volatile owing to both politics and economics. Of potential interest is the idea promulgated in some circles that preference be given to uranium from ISL projects because of a real or perceived lesser environmental impact that conventional mining.

Uranium supply and demand forecast (USD40lb scenario), mln lb



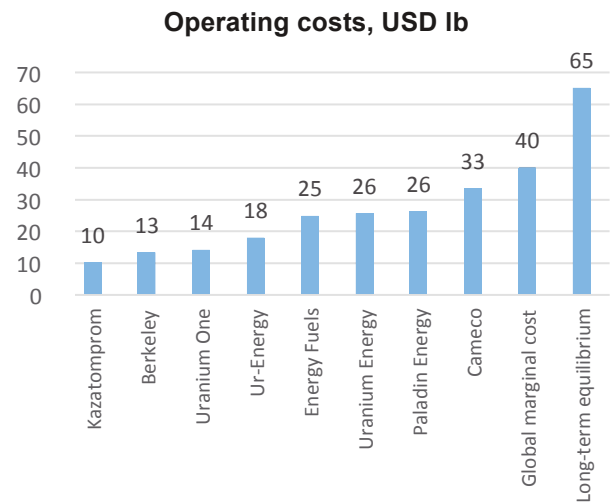
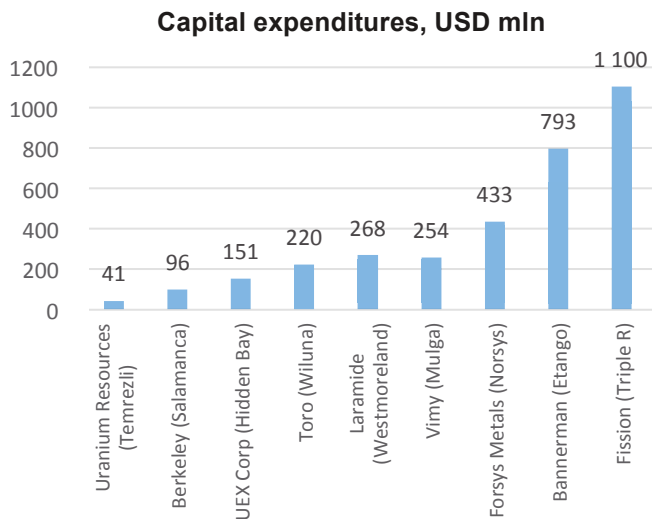
Source: Cantor Fitzgerald

2.4 Capex and operating costs

The costs to produce uranium dropped by an average of USD2lb from 2014 level to USD39lb in 2015. As such, 2015 marked the first year of global mining cost deflation since 2010. This is positive for uranium miners worldwide after years of squeezed margins due to lower prices. The key drivers of the cost deflation were currency depreciation, productivity improvements, and fall in sulphuric acid prices. In 2015, the ruble (59%), the tenge (29%), the Australian dollar (20%) and the Canadian dollar (16%) depreciated against the USD. These substantial depreciations in major uranium-producing countries effectively offset rising local input costs at most mines. Sulphuric acid prices fell by an average of 20% YoY in 2015 compared with the average price of the previous 4 years. Furthermore, the fall in diesel prices cut logistics costs, favoring mines in remote locations for which logistics account for a larger share of costs.

Kazakhstan and its in-situ leach (ISL) mines dominate the 1st quartile of CRU's global uranium business costs curve. Sulphuric acid is a key cost driver for Kazakh ISL mines and, over the past few years, Kazakh operations have benefited from a less volatile and lower priced acid market. Mine gate prices in Kazakhstan have moderated from 2011 highs of USD280-320 per ton down to USD120-140 per ton in 2015. A relatively tight market for skilled labor is pushing local wages higher, but as a result of the sharp depreciation in tenge the wage inflation in USD-terms was negative in 2015.

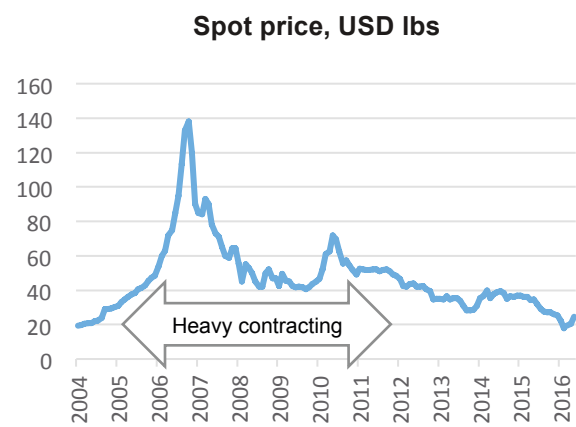
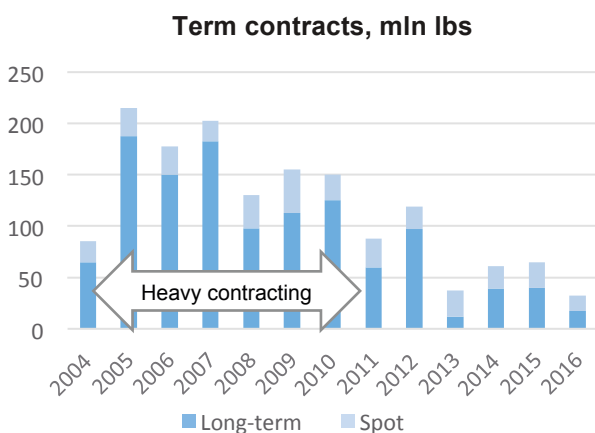
McArthur River in Canada remains the lowest cost underground mine in the world and production costs fell slightly in 2015 in Canadian dollar terms, while in USD terms the reduction was significant due to the depreciation of the local currency.



Source: Dundee securities, public company estimates, company's reports

2.5 Uranium price outlook

Starting from 2004 uranium prices began to rise because of expectations of further penetration of nuclear power in electricity generation, declining inventories, and US dollar appreciation. Spot prices reached a record high of USD136lb or USD350kg. Prices resumed their downward trend, falling to USD41lb in 2010, and incident at Japan's Fukushima Daiichi nuclear plant pushed prices further downward to USD34lb by the end of 2013.



Source: UxC, Bloomberg

It is expected that very few mines will be developed at today's low prices level. Thus, the shortages of supply combined with rising future global demand may support uranium prices. China will focus on investing in mines to satisfy domestic demand and on maintain long-term supply contracts with select few trading partners, such as Kazakhstan.

Uranium spot prices fell from 2016's high of USD35.38lb in January to USD17.75lb as at end-November 2016, their lowest level since February 2005 and recovered to around USD20lb by year-end as oversupply remained intact. The uranium market is expected to remain well-supplied through 2020. Premised on this, spot prices are projected to stay moderate at the range USD30lbs. However, there are several price supporting factors, such as major American and European nuclear reactors are coming off supply in 2017 and 2018 and will be looking for long-term contracts once again. Market participants expect uranium prices to hover at around USD30-50lb in 2017-2019.

Uranium prices forecasts, USD/lb

Mineral	Spot price	1Q17f	2Q17f	3Q17f	4Q17f	2017f	2018f	2019f
Bloomberg consensus	26.5	28.0	29.5	35.3	39.0	30.0	38.0	55.0
Forward price		25.3	26.5	26.7	27.0	26.4	27.9	29.6

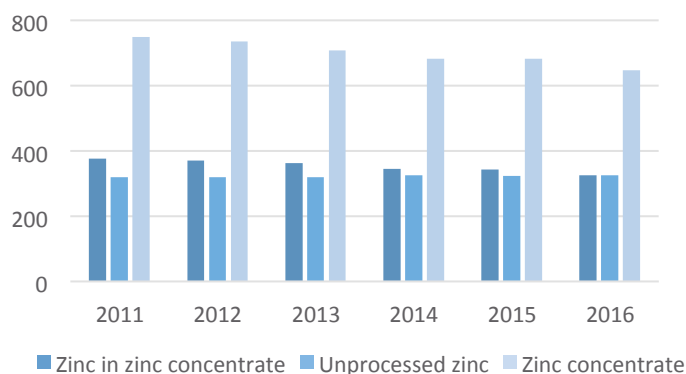
Source: Bloomberg, Samruk-Kazyna

3. Zinc

3.1 Production in Kazakhstan

In 2016, the production of unprocessed zinc amounted to 325ths tons (+0.5% YoY), zinc concentrate at 647ths tons (-5% YoY), zinc contained in zinc concentrate 326ths tons (-5% YoY). Kazakhstan exports almost 87% of its unprocessed zinc. Major unprocessed zinc export destinations are China (33%), Turkey (31%), Netherlands (15%) and Russia and Ukraine (11%). The rest of produced zinc is used domestically primarily by Mittal Steel Temirtau for production of galvanized steel sheets.

Zinc production (2011-2016), '000 tons



Source: Agency of statistics, Samruk-Kazyna

The majority of zinc production is concentrated in the East Kazakhstan region. Kazzinc, located in Ust-Kamenogorsk and KAZ Minerals are major manufacturers in the field. Nova-Zinc, which is a subsidiary of the Chelyabinsk Zinc Plant produces another 66 tons in the Karaganda region. Zinc production declined due to lower zinc in concentrate as mining at Artemyevsky moves through a low zinc grade zone ahead of its mine extension project and as output from Orlovsky is reduced due to mine maintenance.

Kazakhstan's unprocessed zinc exports

Unprocessed exports	11M2016		11M2015		YoY growth	
	'000 tons	USD mln	'000 tons	USD mln	'000 tons	USD mln
Total	259.4	483.4	268	540.2	-3%	-11%
China	86.5	157.1	155.6	314.9	-44%	-50%
Turkey	79.8	148.5	86.7	171.7	-8%	-14%
Netherlands	39.6	68.4	-	-	-	-
Russia	20.3	45	18.1	39.8	12%	13%
Vietnam	21.6	41.2	-	-	-	-

Source: Agency of statistics, Samruk-Kazyna

Domestic consumption of unprocessed zinc rose by 32% YoY to 38,700 tons in 11M16, while exports declined by 3% YoY to 259,400 tons. Thus, the share of domestic usage grew to 13% from 10%.

Unprocessed zinc usage

	'000 tons		YoY growth	Share	
	11M16	11M15		11M16	11M15
Export	259.4	268	-3%	87%	90%
Domestic	38.7	29.3	32%	13%	10%
Total usage	298.1	297.3	0.3%	100%	100%

Source: Agency of statistics, Samruk-Kazyna

The country has more than eighty zinc deposits, of which about thirteen are producing. Kazakhstan's zinc ore has low-quality characteristics resulting in higher than average mining and processing costs, on a global scale. All the zinc metal in the country is produced by Kazzinc. Kazzinc with annual output of 305k tons of zinc metal is the largest zinc producer in the country, accounting for 90% of Kazakhstan's annual zinc output. Kazakhmys is the second largest producer with an output of 94k tons zinc concentrate.

Select zinc deposits in Kazakhstan, tons

Deposit/mine	Company	Measured resources	Mining method
Maleevsky	Kazzinc	651	OC
Ridder-Sokolny	Kazzinc	150	UG
Tishinsky	Kazzinc	784	UG
Shubinsky	Kazzinc	320	UG
Shaimerden Stockpiles	Kazzinc	927	OC
Obruchevskoe	Kazzinc	-	UG
Akzhal	Chelyabinsk pipe works	439	OC
Shalkiya	Shalkiya Zinc	3,200	UG
East region & Bozymchak mines	Kazakhmys	3,600	UG, OC

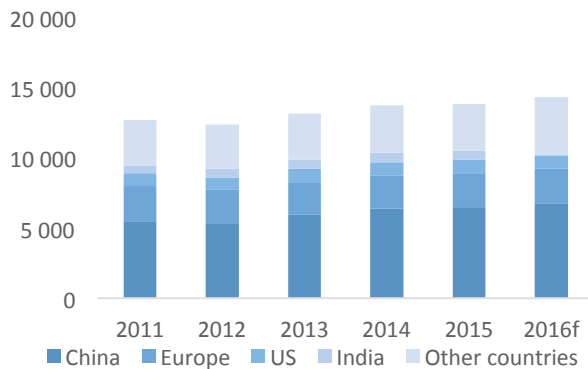
Source: Companies' data, Samruk-Kazyna

3.2 World zinc demand

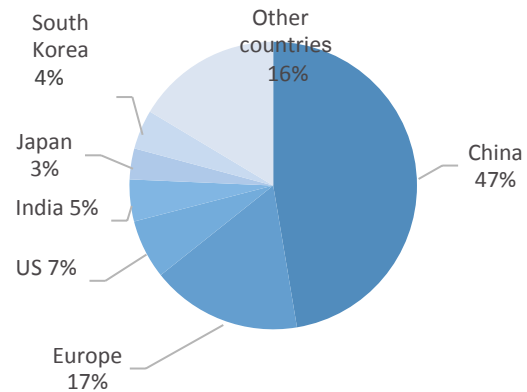
About 50% of world zinc production is used in the construction sector, and the rest is used in industrial machinery, electronics and consumer products. The overall pace of zinc consumption in the European and US markets has tumbled significantly since 2004, while Chinese zinc consumption almost doubled. China remains the most important factor in zinc consumption, which accounts for around 47% of global consumption.

In 11M16, refined zinc metal consumption amounted to 12.8mln tons, 3.5% higher than YoY. The demand growth was primarily driven by a growth of Chinese apparent usage of 8.8%, while demand in Europe remained at the same level as in 2015 and in the US declined by 12.7%. Chinese net imports of refined zinc metal increased by 7.9% to 382ths tons.

Zinc demand by region (2011-2016e), '000 tons



Zinc demand by country (2016e)



Source: ILZSG, Samruk-Kazyna

Global demand for refined zinc metal is anticipated to increase by 2.1% YoY to 13.85mln tons in 2017. The main demand growth will come from China (a rise of 1.3% in 2017) which experiences increased demand from the automotive sector. Zinc demand in Europe remained flat over the past four years and this trend is expected to continue in 2017. In the US, zinc demand is forecasted to rebound by 11.8% in 2017.

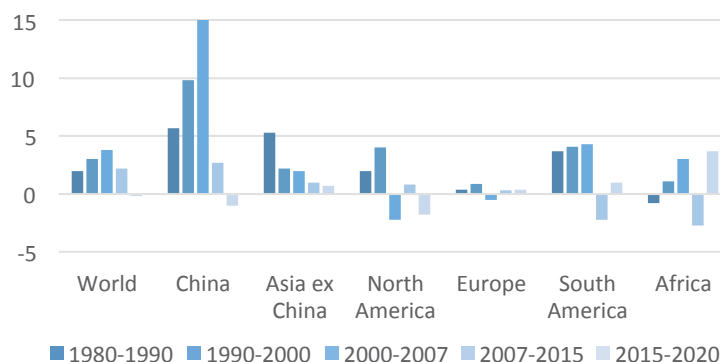
Zinc demand and supply forecasts

mln tons	2016f	2017f	Change, %
Production	12.47	13.20	5.9%
Consumption	13.57	13.85	2.1%
Balance	-1.10	-0.65	-40.9%

Source: ILZSG

China is expected to remain as the main driver of zinc consumption growth. It accounts for 47% of global consumption. Robust activity in the housing and vehicle markets, together with numerous government infrastructure projects, will boost zinc usage. Zinc demand will also benefit from thriving automotive sales in the EU and India. Zinc consumption in the US is driven predominantly by the automotive and construction sectors. The urbanization and industrialization of China will result on a continuing increase per capita zinc production. Long-term demand will be supported by zinc's first use of galvanizing and final use in construction. Zinc demand is expected to grow at an average rate of 2.2% per annum until 2035.

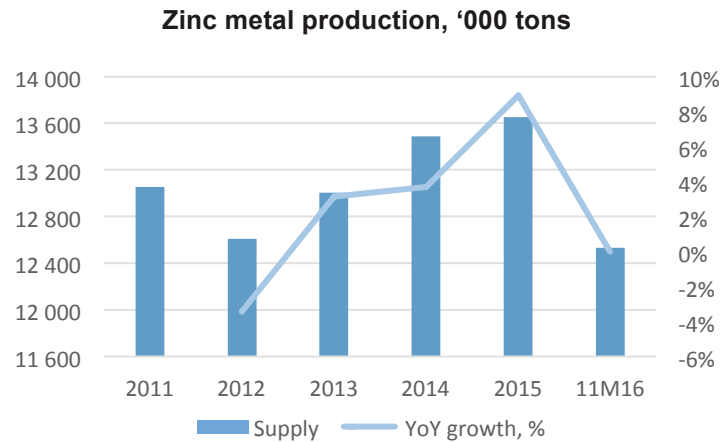
Zinc demand growth, %



Source: CHR Metals Ltd

3.3 World zinc supply

In 11M16, global refined zinc metal production amounted to 12.5mIn tons, which was at the same level YoY with increases in China offset by reductions in Australia, India, Japan, Mexico and the US. The YoY growth decelerated due to the closure of the Century Mine in Australia and Lisheen Mine in Ireland, the voluntary closure of two key mines.

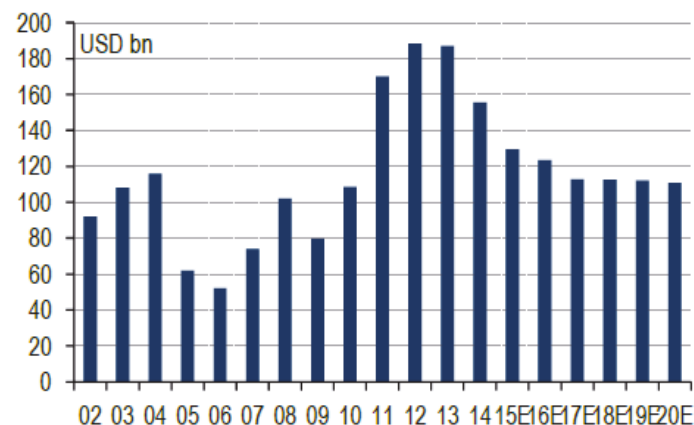


Source: ILZSG, Samruk-Kazyna

In 2017, world zinc metal production is expected to grow by 2.9% YoY to 13.6mIn tons. The increase will be driven by a rebound in Australia, India, and Mexico. However, the market is expected to remain in deficit with the extent of the shortage forecast at 248,000 tons in 2017.

Zinc is one of the least consolidated metal markets. Almost no miner has a strategic focus on the metal, so supply growth is very weak. Capex cuts are also affecting negatively. The concentrates market is tight, and that will not change in the coming years. In 2015-2016, capital expenditure of top-17 zinc miners declined as the development of projects has been gradually falling.

Top-17 zinc miners capex



Source: CRU, Woodmac, SNL, Bloomberg, company reports, BofA Merrill Lynch Global Research

The business environment will likely remain challenging for smelters in the year ahead, especially for China's zinc smelters as they are squeezed between severe tightness in concentrate supply and a

decline in the growth of demand for zinc metal. Smelting capacity is going to rise, adding to the fierce competition for business that has been dragging down treatment charges.

		Treatment charges	
		Low	High
Zinc price	Low	<ul style="list-style-type: none"> · Tight concentrates market · Oversupplied refined market · Smelters and miners under pressure 	<ul style="list-style-type: none"> · Oversupplied concentrates market · Oversupplied refined market · Miners under pressure; mine production tends to be cut
	High	<ul style="list-style-type: none"> · Tight concentrates markets · Tight refined market · Mine supply constrains smelters; high incentive for miners to invest in capacity 	<ul style="list-style-type: none"> · Oversupplied concentrates market · Tight refined market · Insufficient smelting capacity · High incentive for smelters to invest in capacity

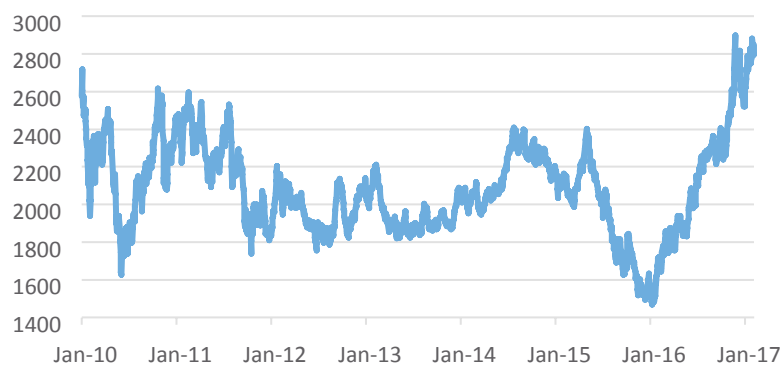
Source: BofA Merrill Lynch Global Research

3.4 Zinc price outlook

Zinc was the best performing base metal in 2016. Zinc price rally was driven by supply dynamics. Demand also rose well, due to galvanized steel, as a result of stronger infrastructure and real estate demand in China. Although prices hit a low of just under USD1,500 per ton in January, they then marched steadily upwards reaching nine-year high of USD2,900 per ton. Although the supply picture is expected to improve somewhat over the coming year, it is likely not enough to rebalance the market, particularly if demand continues to remain strong.

For 2017, the big question is how quickly supply will come back on stream in response to higher prices and in particular when Glencore will ramp-up its mines again. In general, we expect a tougher market environment with increased competition around the globe. At the same time, the outlook for zinc market is constructive, supported by solid Chinese macroeconomic data and birther prospects of US infrastructure spending. Prices are now almost in the USD2,700-2,800mt zone, while global net cash costs of 14 largest zinc producers were much lower at USD1,200-1,300. Zinc prices are forecasted to hover around USD2,400-2,700/mt in 2017-2019.

Zinc LME prices, USD/mt (2010 – 8 February 2017)



Source: Bloomberg, Samruk-Kazyna

Zinc price forecasts, USD/mt

Mineral	Spot price	1Q17f	2Q17f	3Q17f	4Q17f	2017f	2018f	2019f
Bloomberg consensus	2,848	2,540	2,487	2,437	2,428	2,472	2,525	2,474
Forward price		2,803	2,851	2,853	2,845	2,838	2,776	2,592

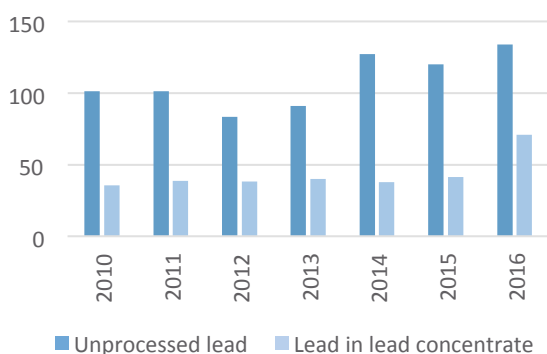
Source: Bloomberg, Samruk-Kazyna

4. Lead

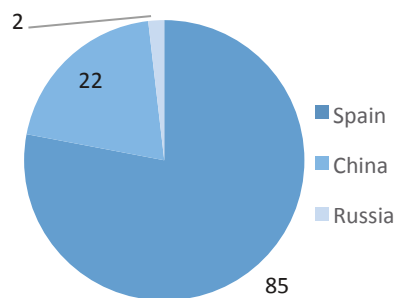
4.1 Production in Kazakhstan

In 2016, production of unprocessed lead amounted to 134th tons and of lead contained in lead concentrate stood 71th tons, representing 12% and 71% YoY growth, respectively. Major unprocessed lead export destinations are Spain (78%) and China (20%). The majority of lead production is concentrated in the East Kazakhstan region. Kazzinc is the major lead producer, which produced 120th tons of refined lead in 2015.

Lead production dynamics in Kazakhstan, '000 tons (2010-2016)



2015 unprocessed lead export routes, '000 tons



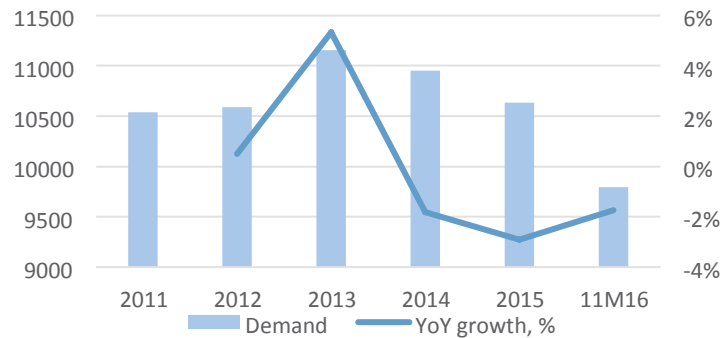
Source: Agency of statistics, Samruk-Kazyna

In Kazakhstan, there are about 96 lead deposits, while only 15 are producing. Lead ore has low quality characteristics, as volume of lead in lead concentrate amounts to around 25-50k tons compared to copper and zinc.

4.2 World lead demand and supply

Global demand for refined lead metal stood at 9.8mln tons in 11M16, which was 1.7% lower YoY. Chinese demand for refined lead metal declined by 9.1%, which was partially offset by a rise in European usage of 9.5%. Lead demand is expected to rise to 11.34mln tons in 2017. It is anticipated that Chinese lead usage will rise by 1.1% in 2017. European usage of lead metal is forecasted to remain flat in 2017. In the US, the latest figures from the Battery Council International (BCI) show a small increase in shipments of both original equipment and replacement automotive batteries this year. This is expected to influence a rise in lead usage of 1.9% with a further increase of the same magnitude forecast in 2017.

World lead demand, '000 tons



Source: ILZSG, Samruk-Kazyna

Batteries account for about 80% of lead demand. The winter is high season for battery replacement since extreme cold weather typically causes failures. Battery makers typically start restocking metal in September or October ahead of the peak season, but the impact often creeps into August as speculators anticipate the surge of buying.

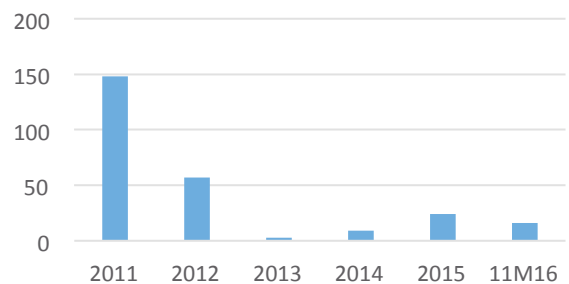
The growth in demand for lead mainly comes from the original equipment manufacturer market for lead-acid batteries, telecom industry utilization for mobile communication station equipment and UPS industrial batteries. In addition, demand for lead is strongly supported by the growth of automobile sales. Lead demand growth depends on demand from China and other Asian, African and South American countries. There is a huge potential but demand growth depends on economic development and ability to withstand environmental scrutiny.

Global lead mine production decreased by 7.5% YoY in 11M2016 due to reduced output in Australia, the US, China and India. Mine closures in Century and Paroo Station in Australia in 2015 reduced annual lead output by 135ths tons. Several large mining companies have cut their lead output, such as Glencore by 100ths tons, Doe Run in Southeast Missouri, CBH Resources at Endeavour mine in Australia and others. World production of refined lead metal fell by 1.2% YoY in 11M2016 despite increases in South Korea and Kazakhstan. This was mainly due to lower output in China. Korea Zinc successfully commissioned a new 130ths tons per year capacity primary lead plant in November 2015

World refined lead metal and mine supply, '000 tons (2011-11M2016)



World refined lead metal balance, '000 tons (2011-11M2016)



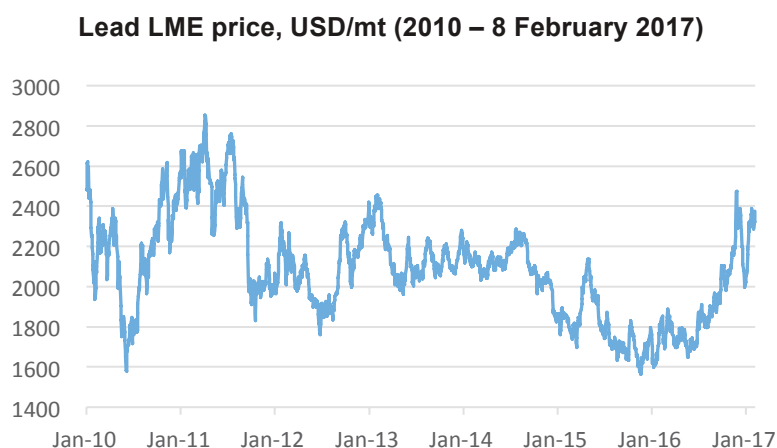
Source: ILZSG, Samruk-Kazyna

In 2017, global lead mine output is expected to rise to 4.91mln tons, while output of refined lead metal is forecasted to increase to 11.36 mln tons. This will be primarily due to rises in Belgium, China, Mexico and the US where Aqua Metals are due to soon commission their new secondary electrochemical refining plant in Nevada. The Republic of Korea is currently the world’s third largest producer of refined lead metal behind China and the US. China accounts for close to 50% of both world refined lead production and consumption.

Globally, on the supply side, the concentrate market is tight. Supplies are hit by mine closure, cutbacks and disruptions. However, nearly half of refined metal produced is from recycled material. As much of the supply comes from recycling, it dilutes the effect of concentrate squeeze. The next generation of mines will come on line by 2018.

4.3 Lead price outlook

Supply was partially curtailed with the closure of mines in Australia and Ireland, while on the demand side, there was a notable expansion of primary smelting capacity by Korea Zinc during the year. Chinese imports reduced by about 9% YtD, but the demand for high-silver lead concentrates grew due to the adoption of a tolling license for silver concentrates. Lead prices remained stable for much of the year, with a spike during the last few months.



Source: Bloomberg, Samruk-Kazyna

Lead has posted the least-impressive gain among base metals in 2016. Prices have recovered from 2015's slump, yet have been limited by low demand for lead batteries and competition from newer, better technologies such as lithium. For the coming year, we expect the market to continue along similar lines. The market environment is likely to become tougher due to increased competition, and to continue to be influenced by stricter environmental regulations. Market consensus is that lead prices would hover around USD2,000-2,300/mt in 2017-2019.

Lead prices forecasts, USD/mt

Mineral	Spot price	1Q17f	2Q17f	3Q17f	4Q17f	2017f	2018f	2019f
Bloomberg consensus	2,389	2,120	2,090	2,100	2,004	2,084	2,148	2,160
Forward price		2,334	2,390	2,394	2,397	2,379	2,384	2,347

Source: Bloomberg, Samruk-Kazyna

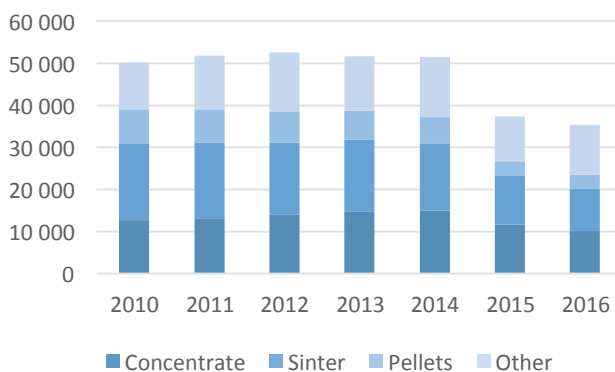
5. Iron ore

5.1 Production in Kazakhstan

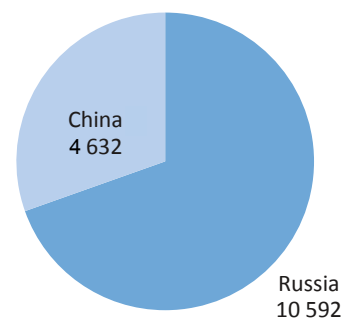
In 2016, the country mined 35.4mln tons of iron ore (-5% YoY), while production of iron ore concentrate amounted to 10,1mln tons, iron ore pellets 3,4mln tons, and iron ore sinter 10mln tons. Main export destinations are Russia (70%) and China (30%).

The country's iron ore reserves are mainly concentrated around Rudniy city in Kostanay region (Sokolovsky, Kasharsky, Korzhinkol'skoye, Sarbaisky and Lisakovski deposits), Karaganda region (Kentobe, Atasu) and Akmola region (Atansore). The major players in the Kazakhstani iron ore sector are Arcelor Mittal Temirtau, the wholly owned subsidiary of the largest global steel producer, Arcelor Mittal, and Sokolov-Sarbay Mining Production Association, part of ENRC's iron ore division.

Kazakhstan iron ore production by product type, (2010-2016), '000 tons



Kazakhstan iron products export routes, '000 tons



Source: Agency of statistics, Samruk-Kazyna

ArcelorMittal Temirtau has four operating iron ore mines in Central Kazakshtan: Lisakovski, Kentobe, Asatu, Atansore. The ore from these mines is dispatched to the wholly owned integrated steel plant located in the Karaganda region of Kazakhstan.

5.2 World iron ore demand

The iron ore market is driven by demand for steel, which in turn is linked to developments in the global economy and its growth. China accounts for more than 50% of seaborne iron ore imports and almost half of the world's total steel production.

Global iron ore demand is expected to remain low. Demand from China, who is the top importer of iron ore, is expected to decline. The global utilization for production of steel has been fluctuating in a narrow range from 65% - 70% (average 67%, according to WSA).

Iron ore supply and demand, mln tons (2010 – 2016e)



Source: Wood Mackenzie, World Steel association, Samruk-Kazyna

Iron ore demand growth is expected to grow 3% in 2017 and on average 1.6% in 2018-2020. The main growth is projected to come from CIS, European countries and India, while in China iron ore demand is forecasted to grow only in 2017-2018 and to decline thereafter.

Global iron ore supply and demand forecasts

Iron ore demand	2017f	2018f	2019f	2020f
Oceania	6	66	7	7
CIS	127	131	138	144
Europe	161	166	171	175
India & other Asia	159	165	175	185
Japan & Korea	209	210	209	208
China	1,092	1,098	1,096	1,080
Other	192	145	214	240
Total iron ore demand	1,946	1,981	2,010	2,039
Iron ore supply	2017f	2018f	2019f	2020f
Oceania	758	761	781	780
South America	464	514	518	534
CIS	163	160	161	165
Africa and Middle east	108	108	111	117
India and other Asia	99	102	103	107
China	234	225	226	225
Other	120	111	110	111
Total iron ore supply	1,946	1,981	2,010	2,039

Source: JP Morgan, Samruk-Kazyna

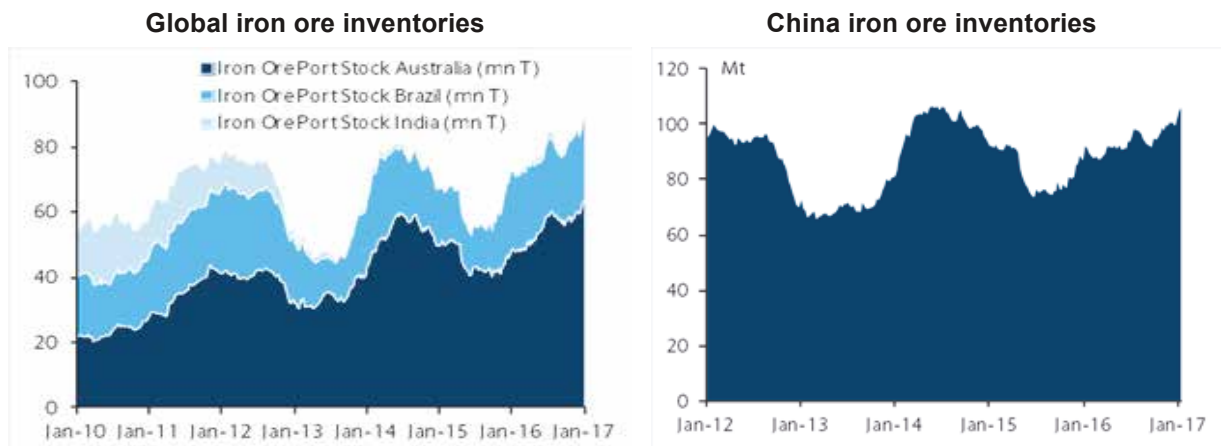
5.3 World iron ore supply

World iron ore production is estimated at 2.2mln tons for the year 2016, down by 2.2% compared to 2015. Australia and India are the main contributors to the growth of iron ore output, as production capacity increases, while China and Brazil squeezed its production the most.

The supply source of iron ore is concentrated, the market share is condensed. Australia and Brazil are expected to acquire up to 58% and 28% (from 54% and 26% in 2015) of market share, respectively. Thus, 86% of iron ore export market share will belongs to these two countries. Mining technology in these two countries allows them to produce iron ore at the cost of below USD50

which mean they still benefit from increasing production, providing that the iron ore price does not fall below USD30 per ton. The new source of supply from Australia and Brazil may increase the overall global quantity by up to 208mln tons in the next four years, enlarging the excess supply by 58mln tons in the next year. As mentioned above, Australian and Brazil miners have production cost advantage. Therefore, these two countries are likely to take advantages of the situation to enhance their capacity to acquire more market share.

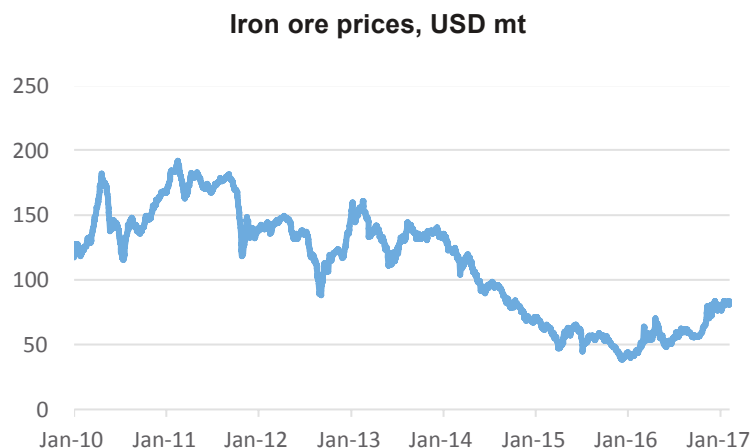
The latest data for global port stocks excluding China showed an estimated 92.5mln tons of iron ore stored outside of China, an all-time high. In China, iron ore inventories stood at an estimated 106mln tons. The lack of tightness in iron ore inventories should yield a quick comedown in prices as soon as downstream demand for metal slackens.



Source: WIND, Bloomberg, Barclays Research

5.4 Iron ore price outlook

Iron ore prices have rallied in 2016 as consumption in China proved resilient and Mr. Trump's win boosted speculation about the outlook for demand. However, Mr. Trump's infrastructure plans remained lacking of details, and the market should be able to fully adjust for this potential growth driver once a quantified and properly-funded program is actually released. The key support for iron ore in 2016 has been the China's credit-backed, steel-intensive infrastructure programs, underpinning steel production.



Source: Bloomberg, Samruk-Kazyna

We believe that in order to keep supply and demand more or less balanced the Big 3 iron ore suppliers would have to keep their output flat in 2017, if not reduce it slightly. Iron ore and metallurgical coal prices have been stronger than expected, although we continue to expect supply to grow more quickly than demand in the near term. We see iron ore market tightening in 2017, as global demand is expected to remain low and possible additional supply from Australia and Brazil to contribute excess supply.

Short-term price indicator

	Copper	Iron ore
China PMIs	Neutral	Neutral
China Monetary policy	Bearish	Bearish
China downstream demand	Bullish	Bullish
Inventories	Bearish	Bearish
Copper import arbitrage window	Bearish	N/A
Copper China premia	Neutral	N/A
China crude steel production	N/A	Neutral
China steel mill profitability	N/A	Bullish

Source: Bloomberg, WIND, Barclays Research

Overall, we believe that with major players even slightly increasing output and at the same time being at the bottom of the cost curve, significant product cuts are unlikely and therefore we do not see the surplus in the iron market abating any time soon. As a result, prices will have to fall in order the market to balance. Iron ore price are expected to be in the range of USD50-70mt in the period of 2017-2019.

Iron ore prices forecasts, USD/mt

Mineral	Spot price	1Q17f	2Q17f	3Q17f	4Q17f	2017f	2018f	2019f
Bloomberg consensus	83.5	67.5	59.0	57.5	55.0	58.0	53.5	54.5
Forward price		80.4	77.0	72.4	67.9	74.4	60.2	51.1

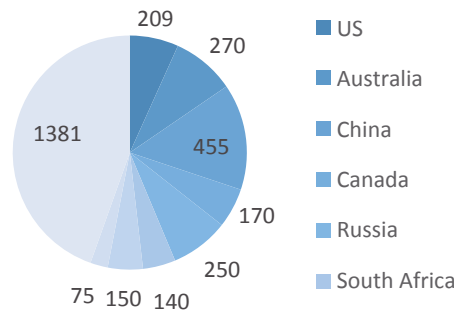
Source: Bloomberg, Samruk-Kazyna

6. Gold

6.1 Production in Kazakhstan

In 2016, Kazakhstan extracted 18,773ths tons of ore containing 74.6 tons of gold from over fifty deposits and was in the top-20 of gold producing countries. Kazakhstan’s state registry of mineral resources lists about 280 gold deposits, most of which are small, but over half of the known resources is concentrated in just a dozen of large deposits located primarily in eastern and northern Kazakhstan. The largest gold deposits of Kazakhstan are Vasilkovskoye, Bakyrchik, Aksu, Suzdalskoe and Varvarinskoye. Most of the gold deposits in Kazakhstan are characterized by low ore-grades which are relatively difficulty to process. To some extent, these difficulties are mitigated by better mining conditions of ore bodies.

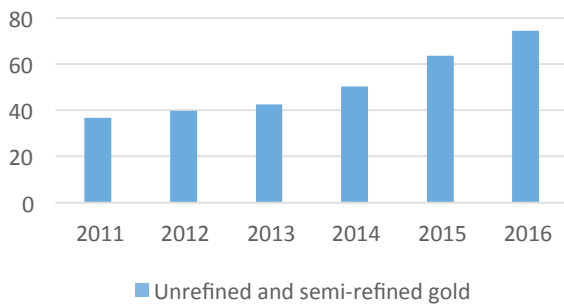
World gold output by country, tons (2016)



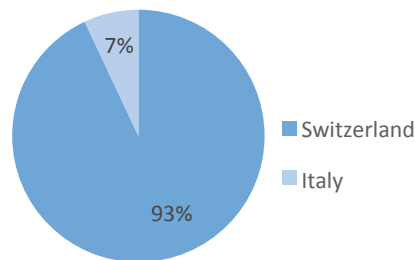
Source: USGS 2017, Samruk-Kazyna

The main export destinations gold of produced in Kazakhstan are Switzerland and Italy. Most of the companies export gold to Switzerland for refining and receive, upfront 70-80%, of gold value upon shipment less refining charges. The rest is usually received within two weeks after reweighting.

Gold production in Kazakhstan, tons (2010-2016)



Gold export by country (2015)

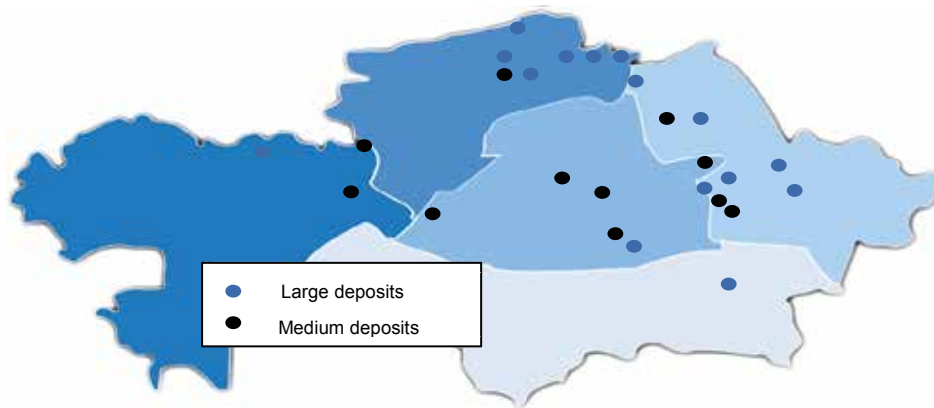


Source: Agency of statistics, Samruk-Kazyna

The largest gold producers in Kazakhstan are Kazzinc, KazMinerals, Polyus Gold, Polymetal, and Severstal. There are also a number of mid- and small-sized companies mining and exploring for gold in Kazakhstan.

The gold mining industry of Kazakhstan has been developing slowly over the last twenty years. This slow growth has a variety of causes. First, the sector needs significant capital investments, as most of the processing and mining equipment is worn out and lacks of efficiency when compared to newer technologies. Second, most of the gold deposits in the country are of small and medium size, which reduces investor interest. Third, more than half of the known gold resources of the country are characterized as difficult for processing and contain hazardous impurities requiring increased capital investment to handle the mitigation of hazardous waste.

Gold deposits in Kazakhstan



Source: various media source

6.2 Gold world demand and supply

In 2016, gold demand increased by 2% to reach high of 4,309tons. Annual inflows into ETFs reached 531.9 tons, the second highest on record since 2009. The growth in ETFs was offset by declines in jewelry and central bank purchases. Annual bar and coin demand was broadly stable at 1,029.2tons, helped by a surge in 4Q16, mainly in China.

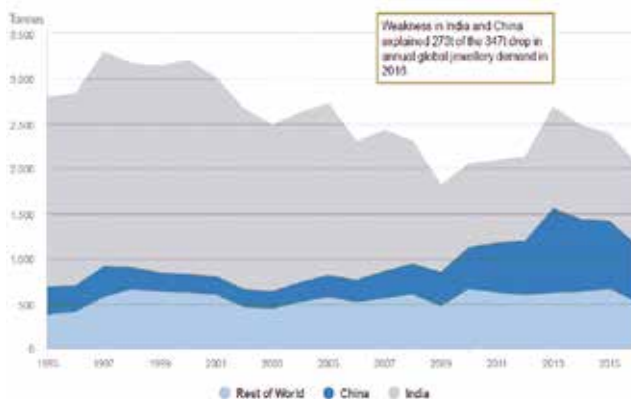
Gold demand, tons (2015-2016)

	2015	2016	YoY growth, %
Gold demand	4,215.8	4,308.7	2
Jewelry	2,388.6	2,041.6	-15
Technology	332.0	322.5	-3
Investment	918.7	1,561.1	70
Total bar and coin	1,047.0	1,029.2	-2
ETFs and similar products	-128.3	531.9	-
Central banks & other inst.	576.5	383.6	-33

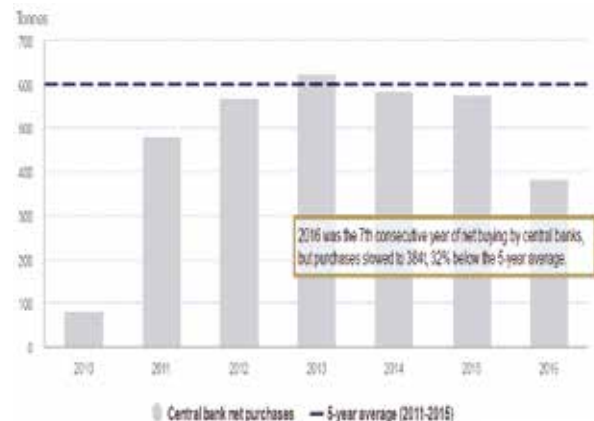
Source: Metals Focus; World Gold Council

India and China accounted for almost 80% of the 347 tons of decline in gold jewelry demand in 2016. India saw the biggest decline with annual jewelry demand declining to a 7-year low amid strikes, regulation and high gold prices. The mild upward trend in US jewelry consumption came to an end in 2016, with demand slipping 1% to 118tons.

Gold jewelry demand



Central bank net purchases



Source: Metals Focus; GFMS, Thomson Reuters; World Gold Council

Central banks purchased 384 tons on a net basis in 2016, which was 33% lower than in 2015. Russia, China and Kazakhstan dominated purchases, accounting for 80% of the full year demand. Gold's relative steadfastness supports the central banks' demand. To that end, central banks continue to acquire gold as a means of diversifying their foreign reserves and it is expected to continue to do so in 2017.

Global mine production growth was flat at 3,236 tons in 2016. Indonesia saw the largest gains in 4Q16, due to the mining of higher-grade ore at Grasberg, which is expected to boost the production further in 2017. China remains as the largest producer in the world, accounting for about 14% of total production. Asia as a whole produces 23% of all newly-mined gold. Central and South America produce around 17% of the total, with North America supplying around 16%. About 19% of production comes from Africa and 14% from the CIS region.

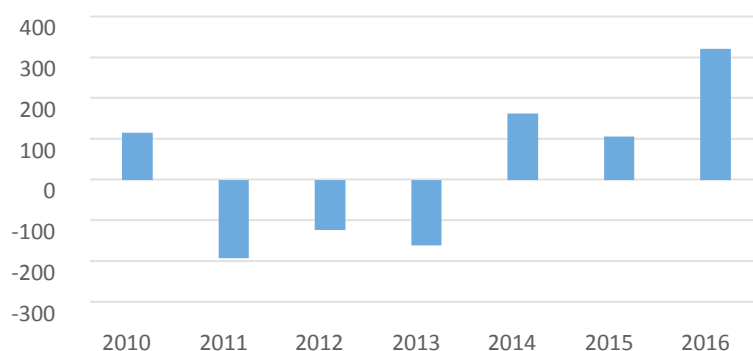
Global gold demand and supply, tons (2010-2016)

	2013	2014	2015	2016	YoY % change
Supply					
Mine production	3,076.3	3,155.3	3,233.0	3,236.0	0
Net producer hedging	-28.0	104.9	13.5	26.3	95
Recycled gold	1,263.1	1,191.2	1,116.5	1,308.5	17
Total supply	4,311.4	4,451.4	4,363.1	4,570.8	5
Demand					
Fabrication					
Jewellery	2,701.4	2,499.1	2,428.9	1,981.9	-18
Technology	355.9	348.7	332.0	322.5	-3
Sub-total above fabrication	3,057.3	2,847.8	2,760.8	2,304.4	-17
Total bar & coin demand	1,707.1	1,040.0	1,047.0	1,029.2	-2
ETFs & similar products	-915.5	-183.8	-128.3	531.9	-
Central bank & other inst.	623.8	583.9	576.5	383.6	-33
Gold demand (fabrication basis)	4,472.7	4,287.9	4,256.1	4,249.1	0
Surplus/Deficit	-161.3	163.5	107.0	321.7	201
LBMA Gold Price (US\$/oz)	1,411.23	1,266.4	1,160.06	1,250.8	8

Source: GFMS, Thomson Reuters, Samruk-Kazyna

The gold market realized an annual physical surplus for the fourth consecutive year in 2016. The market's surplus of 322 tons was more than three times larger than surplus of 107 tons in 2015.

Gold physical surplus /deficit, tons (2010-2016)

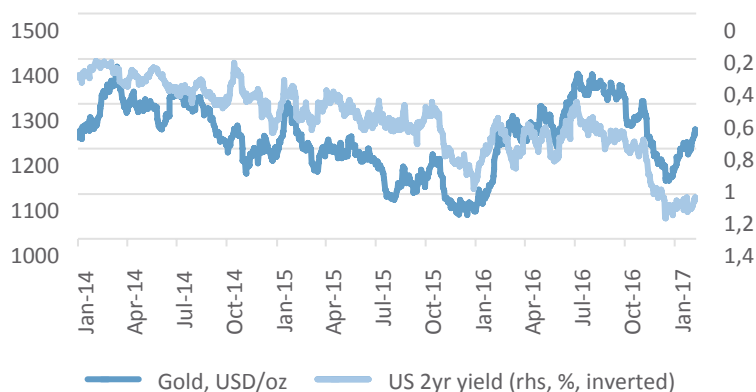


Source: Thomson Reuters, Samruk-Kazyna

6.3 Gold price outlook

Meanwhile, gold is seen as a good portfolio diversifier given its weak correlation with the major asset classes. We expect modestly higher real yields and a firming US dollar to be headwinds for gold in 2017. In the short-term, gold and silver prices are likely to come under pressure as we approach the rate hike in 2017. However, we believe that the Fed will remain behind the curve and inflation will rise faster than the central bank will raise rates, keeping real rates low. Low real rates are gold price positive. An interest rate hike means a higher opportunity cost of holding gold. Higher yields become more interesting, while interest in gold drops.

Gold vs. two year US yield



Source: Bloomberg, Samruk-Kazyna

Political uncertainty is also a key influence, increasingly in Europe, where 2017 brings the prospect of elections in France, Germany, the Netherlands and, possibly, Italy. The forecast reduction in global mine output and a gradual recovery in demand will see the physical surplus fall in 2017 but remain high. The gold market and future price moves will remain highly reliant on sentiment-driven factors, at least in the short term. Given these contrasting outcomes and a great degree of political uncertainty we would not be surprised if the gold market experiences increased volatility in the coming months. Investors considered precious metals as a safe heaven. Worries about the global economy and high market volatility provided support to gold. Gold prices are expected to hover around USD1,200-1,300/oz in 2017-2019.

Gold prices forecasts, USD/t oz

Mineral	Spot price	1Q17f	2Q17f	3Q17f	4Q17f	2017f	2018f	2019f
Bloomberg consensus	1,241	1,200	1,225	1,250	1,250	1,250	1,300	1,300
Forward price		1,223	1,242	1,247	1,251	1,241	1,264	1,290

Source: Bloomberg, Samruk-Kazyna

7. Conclusion

Commodities are continuing their rebalancing process, though progress is uneven and inventory overhangs remain large. However, this headwind should start to ease in the second half of 2017. Industrial metals are slower to adjust, and any further resilience will depend on continued producer discipline and China's willingness to add more stimulus. Meanwhile, gold is seen as a good portfolio diversifier given its weak correlation with the major asset classes. Yet, we expect higher real yields and a firming US dollar to be headwinds for gold in 2017.

The rising trend for commodities should continue, but selectively. We remain optimistic regarding base metals, but the outlook for precious metals, especially gold, is less positive. The outlook for zinc and lead markets is constructive, supported by solid Chinese macroeconomic data and brighter prospects of US infrastructure spending. We see iron ore market tightening in 2017, as global demand is expected to remain low and additional supply from Australia and Brazil to contribute to excess supply.

In the long-term, we view the market fundamentals remain attractive as long-term demand outlook for commodities remains positive, sector has reasonable barrier to entry, and miners have far greater flexibility on growth capex than any other sector. Long-term demand for zinc will be supported by its first use of galvanizing and final use in construction. The world's overall nuclear generation capacity is expected to increase. This will result in an increase of reactors' demand for uranium. Growing telecom industry and ongoing infrastructure development in India, and rising share of electric in China will support industrial battery demand and consequently lead demand growth.

In 2016, growth in the production of most mineral commodities in Kazakhstan was mixed. Uranium production in 2016 is estimated at 24,000 tons, which was 1.7% higher YoY. In 2017, the uranium production is expected to decline by about 8% or 2,000 tons due to weak market conditions triggered mostly by a global oversupply. This represents about 3% of the total global output. The production would pick up pace once market conditions improve. Kazakh zinc production declined due to lower zinc in concentrate as mining at some fields moves through a low zinc grade zone and due to maintenance works. Gold production in Kazakhstan continue to increase on the back of rising gold purchases by the central bank.

The mining industry continued efforts to reduce costs and improve efficiencies and is increasingly coming under pressure to shift their strategic planning, delay new investments and look to long-term future growth. Kazakhstan has competitive advantages in terms of massive reserves of base and precious metals, low cost uranium production. However, lack in technology, high losses during extraction and depletion of reserves in some metals are one of the main constraints of Kazakh mining companies. In this environment, the mining companies that will come out of this strongest are those that succeed best in adapting their operations and business to the new market situation.

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