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Industry Update

Uranium: Time "U" move?

The going has been tough. After several false dawns for a renaissance in the nuclear sector, we have taken stock to consider if things really are different this time. Since the Fukushima disaster in March 2011, uranium equities have been decimated with companies listed on the ASX and TSX reducing in number from 585 to ~50, and a loss of over 70% of market value of major listed producers. Weak pricing, production curtailments and project deferrals have weighed heavily on investor sentiment, overwhelming the critical role that nuclear power still has on providing base load energy and meeting global emissions targets. However are green shoots starting to appear?

Destocking to offset curtailed production, but only to a degree; Uranium spot price risks to the upside: Recent cuts by Cameco (CCO-TSX : C$14.45 | Not rated; ~5% of global production) and 10% cuts at KazAtomProm should see increased destocking and supply up to 20% of consumption (2017 market size of ~170mlbs). Overall enriched inventories remain at six years, which is sufficient for energy utilities, however, utility under buying and emerging purchasers such as newly listed Yellow Cake (YCA-LSE : 224.00p | Not rated; buying ~7Mlbs in 2018) investment vehicle could place upward pressure on mined supply. Prolonged restarts aside, ***if mobile inventory approaches sensitive levels, there is a risk to the upside on spot pricing, in our view.***

Long term contracts starting to roll off, marginal production can be rationalised. The long term nature of pricing and deliveries has offered a degree of price protection to producers over recent years (current U_3O_8 price; LT US$34/lb, spot US$26/lb). As these have rolled off, large producers are fulfilling obligations with opportunistic spot purchasing (i.e. Cameco meeting up to 80% of 2018 sales through this strategy) in lieu of loss making mine production. Despite increasing rates of reactor restarts (nine in Japan thus far in 2018), this could be a risky strategy in our view, with over 50% of utility providers seeking to renegotiate LT supply contracts over the next five years.***This could place pressure on previously insulated higher cost producers.***

China - Key demand thematic remains in place. Nuclear power in China only provides 4% of overall requirements (vs OECD of 11%), rapid reactor build out remains one of China's key CO_2 abatement strategies. Notwithstanding recent Sino-American political rhetoric (US supplies ~30% of China's enriched U_3O_8 requirements) China is expected to bring online additional nuclear capacity from 2020 to 2030 of 9.0GWe/year, providing a solid basis for demand growth. ***This is expected to be a key driver in consumption, potentially doubling from current levels of ~180Mlb pa by 2030.***

Featured ASX-Listed Uranium Companies

Berkeley Energia (BKY-ASX : A$0.74 | Not Rated) - Fully funded to construct the next mine globally at Salamanca, Spain.

Boss Energy Resources (BOE-ASX : A$0.07 | Not Rated) – Restarting Honeymoon Well.

Paladin Energy (PDN-ASX : A$0.21 | Not Rated) – Repaired balance sheet with largest leverage to improved uranium sentiment through restart of Langer Heinrich in Namibia.

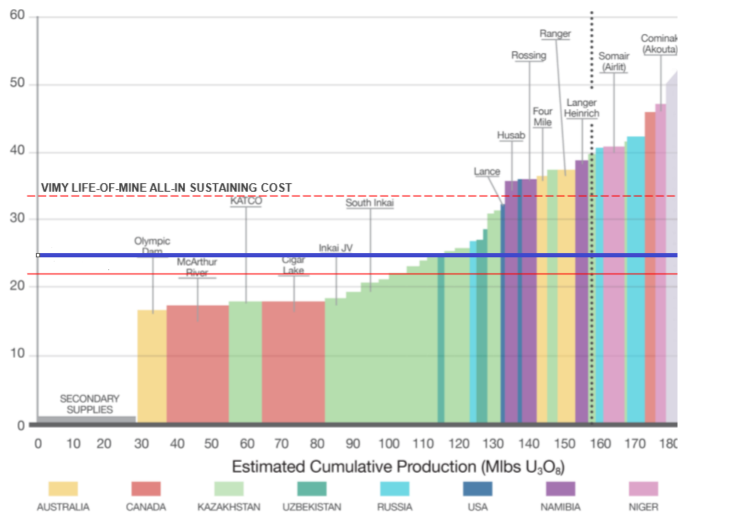
Peninsula Energy (PEN-ASX : A$0.27 | Not Rated) – The newest US domestic producer at Lance in Wyoming. Is it the benefactor of potential US trade policy changes?

Vimy Resources (VMY-ASX : A$0.10 | TP: $0.50/sh, SPEC BUY, Tim McCormack) Mulga Rock: The most advanced of the four permitted Australian projects .

For important information, please see the Important Disclosures beginning on page 45 of this document.

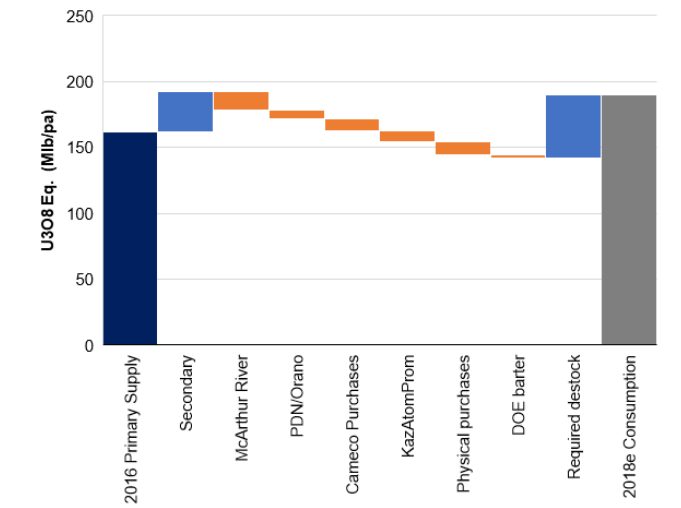
Uranium Market in 6 key charts:

Figure 1: Uranium is not an appealing business to be in prima facie at spot pricing with ~40% of mined supply "under water"*.



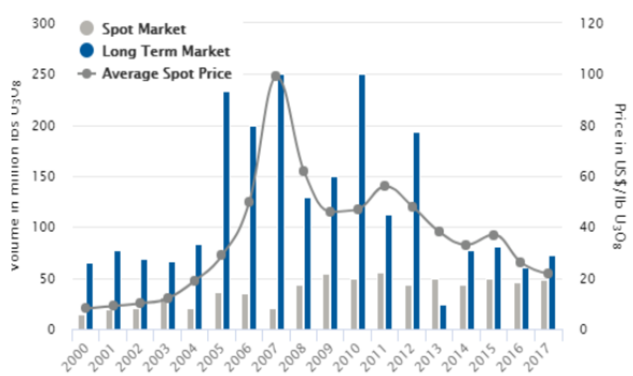
Source: Vimy Resources Presentation,* Cost of production (US$/lb), Blue is spot 25/7/2018 of US$23/lb.

Figure 2: Leading to arbitrage between spot and contract prices which we expect will lead to increased destocking over 2018.



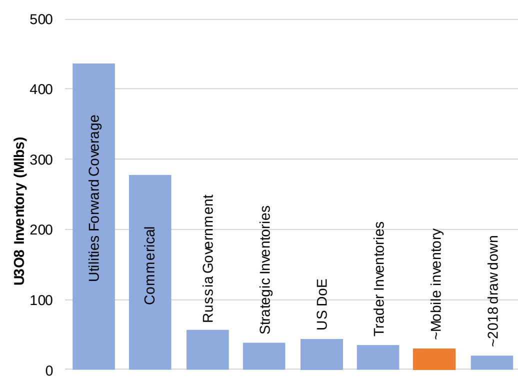
Source: Company Reports, Canaccord Genuity estimates

Figure 3: LT contracts (usually 7 years) peaked in 2010 and are now rolling off – market tightening evident (U_3O_8 price +20% since May'18)



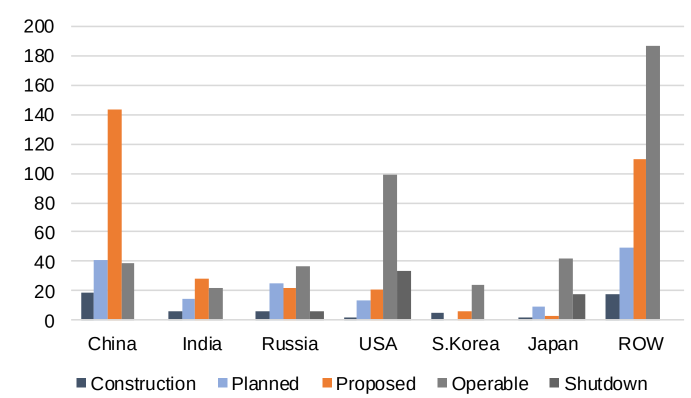
Source: Ux Consulting, Cameco

Figure 4: While enriched inventory represents ~6 years current consumption, how locked up this is remains a key question…



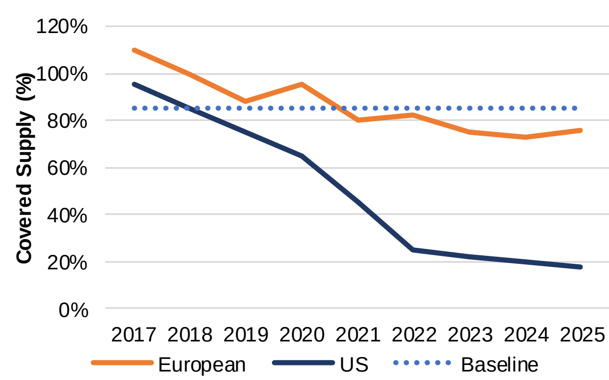
Source: World Nuclear News, Canaccord Genuity estimates

Figure 5: Underlying all of this, there remains a commitment to reactor build out…



Source: IAEA

Figure 6: …that requires covered feedstock as construction begins*



Source: EIA, Euratom Supply Agency; *Indicates future contract coverage rates

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Investment Summary

Since the disaster at Fukushima, Japan in March 2011 where a 9.0 magnitude earthquake triggered a Tsunami that damaged the Daiichi nuclear facility, confidence in the outlook of the uranium sector all but evaporated with a collapse in the spot price (US$70 to US$22/lb U_3O_8) and a deterioration of the junior end of the sector (from 585 companies in 2011 to currently ~50 ASX/TSX listed companies) over this time.

The Fukushima event saw an immediate shutdown of over 40 reactors, that had previously provided ~30% of Japan's electricity production. Over 12 of these have been permanently closed however the restart program has now begun with nine reactors being brought online over 2018. Under the latest plan, Japan anticipates that around 30 reactors need to be reactivated to achieve a targeted energy mix of ~20% nuclear by 2030. The restart program now underway will start to consume Japanese stockpiles (currently ~102 mlbs). Given this previously provided a key source of 'mobile inventory' that re-entered the market, we believe subsequent reductions could positively impact uranium prices over the short term.

Uranium in a post Fukushima world…

Post Fukushima, the response from most other countries has been to increase the safety and permitting requirements to operate a nuclear power facility. In key markets such as France, the US, the UK and Russia there has been no net increase in operating reactors over the last decade with countries particularly in Europe positioning for a reduced reliance on nuclear energy in favour of heavily subsidised renewables. The move towards renewables however faces considerable switching costs and demand management to meet base load requirements.

Like so many other commodities, China is a key demand driver

While nuclear power in China only meets 4% of overall requirements (vs OCED of 11%) rapid reactor build out (enabled through modularity such as the AP1000 model) is one of China's key CO_2 abatement strategies. To achieve stated aims of moving to 20% non-fossil fuel energy generation by 2030, we estimate China will require a five-fold build out of installed nuclear capacity which we expect could require an additional 67 mlbs (or 1/3 of current demand) of U_3O_8 consumption. Conservatively these estimates, based on latest EIA forecasts, only assume that nuclear power's contribution to the energy mix remains steady at 11% with total global energy demand to increase by 35% over this time.

Mobile inventory a key swing factor

In the current environment of sluggish primary consumption, operating reactors that have been placed on standby (i.e. Japan) have continued to receive enriched uranium due to take or pay contractual terms. This booked inventory has presented as a key overhang on spot uranium pricing in recent years. We understand that stockpiled uranium inventory (U_3O_8) is the equivalent of seven years of current consumption and beyond what most authorities deem strategic levels. The drawdown of this as "mobile inventory" (as per Figure 4) to balance out curtailment of current production will provide a key influence on any near-term price recovery in our view.

Better to buy than mine?

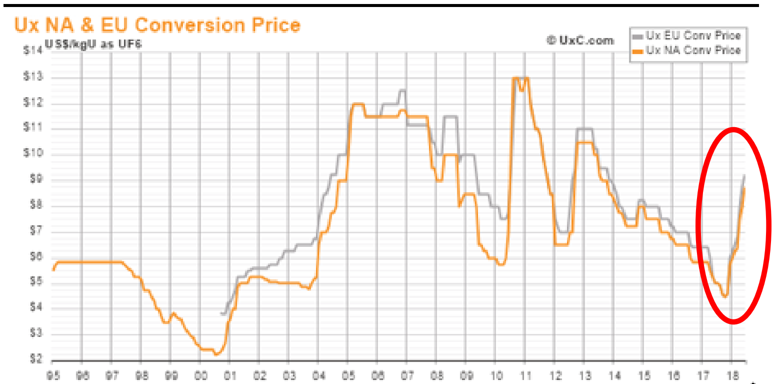
On the supply side, curtailment of ~17% of global mined production is expected over 2018 driven by either capital preservation such as Paladin Energy (ASX-PDN | NR) or strategic purchasing such that planned by Cameo (TSX-CCO : C$14.45 | NR) to replace ~15 mlbs of production suspended from its McArthur River mine. With ~40% of global mine supply out of the money at current spot prices, we expect that producers will continue to rationalise over the short term with pro-active purchasing in the spot market (~50Mlbs in volume) to fulfil supply agreements.

The propensity for "under buying" primary production by utilities (as in Figure 8) since Fukushima is suggestive of running down large long term/higher priced contract positions that were entered into before 2011. Along with most new supply coming from low cost ISR production in Kazakhstan, high cost producers have been squeezed out as the overall cost curve flattens.

Supply chain behaviour changes suggest potential for better prices

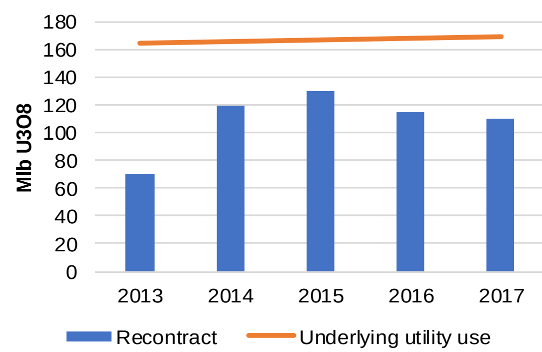
Notwithstanding the recent bleakness there are early clues for a turn in market conditions. One signal in our view is the "Ux Conversion price" which considers offers for deliveries up to a year in advance, and escalated offers for multi year deliveries. Figure 7 indicates a doubling in price of uranium in its enriched product form (uranium hexafluoride UF_6) over the last six months. This suggests that the deliberate underbuying by utilities (see Figure 8) since Fukushima is likely to abate, and the potential for improved enrichment margins to flow through to uranium concentrate suppliers.

Figure 7: Conversion Price of enriched product – first uptick since 2012



Source: UxConsulting

Figure 8: Demonstration of "underbuying"



Source: Republished from Paladin Energy Presentation

Favourable geopolitical environment?

The geopolitical aspects of uranium are also likely to create some potential supply side constraints over the medium term in our view. Firstly, the US, under the guise of 'national security' is placing a temporary suspension on drawing down of the Department of Energy (DoE) stockpiles (~13% of total current inventory).

Pending approval of a petition into the Section 232 of the US Trade Expansion Act (1962) regarding a restriction of uranium imports to the US, a quota of 25% of consumption (against 5% currently) would be reserved from US uranium which has the potential to draw further on stockpiles. This could also be exacerbated by any further import restrictions placed on imports from state backed production from Russia and former soviet states Kazakhstan and Uzbekistan which currently account for ~ 40% of US uranium consumption.

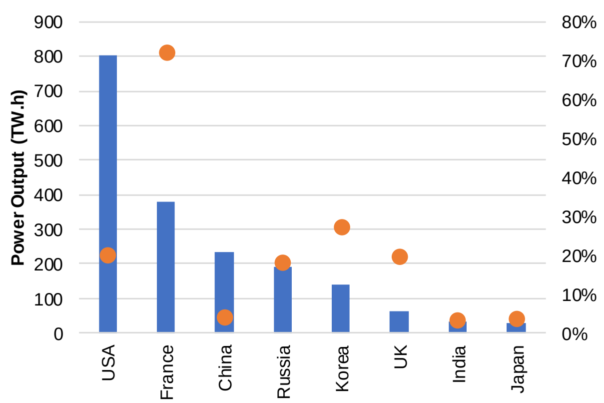
In conclusion we take a constructive view on the short-term outlook for uranium pricing. This owes to the potential squeeze in mobile inventory that can substitute the level of curtailment (~20% of market) in mined supply. With the demand side still offering incremental growth (CGe ~5% CAGR) that requires covered feedstock over the near term, we view that advanced developers and idle producers are in an improved negotiating position to formalize product offtake offering the potential for share price appreciation.

Demand

There are currently ~450 commercial reactors in operation in 31 countries generating total electricity of around 25,000 TWh net which represents ~ 11% of total global requirements, equating to demand of ~170 mlbs of U_3O_8 (reactors typically burn circa 27t of uranium fuel for each GW of electricity produced). Consumption has remained at a stable level since 2011 with the large scale closure of reactors in Japan post Fukushima, being partially offset by the commissioning of new facilities in China as shown below in Figure 10.

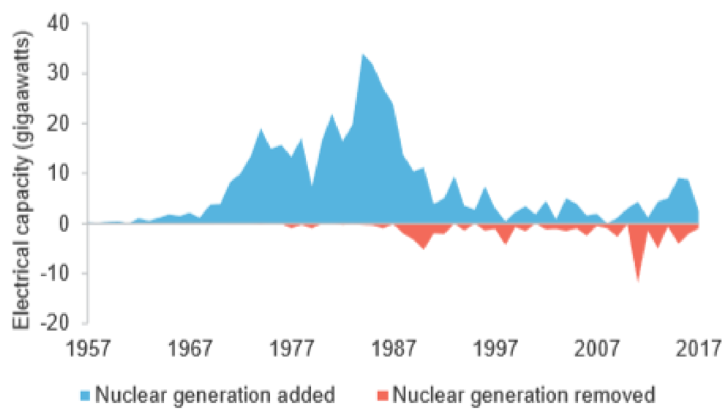
Historically the US and France have dominated demand with 25% and 16% of the current operating nuclear capacity, with France itself generating over 70% of its electricity requirements from nuclear facilities.

Figure 9: Global electricity output and proportion as nuclear



Source: World Nuclear Association.

Figure 10: Nuclear Power Generation balance since inception



Source: Office of Chief Economist

Key Consumers

Japan: Following the Fukushima incident, four Fukushima Daiichi reactors (units 1-4) were permanently shut down and units 5 and 6 were taken out of service before being permanently retired in late 2013. The remaining 48 reactors in the country were progressively taken offline for mandatory maintenance outages.

This had the effect of reducing nuclear power from 31% of energy requirements pre-Fukushima to less than 3% up to the end of 2017. LNG became the main replacement source of base load energy generation increasing from 18% to ~50% over during the 2010-2017 period.

As of July 2018, nine of the 42 operable reactors have restarted. Restarts are a delicate political issue with around 30 reactors required to be operating to meet 2030 targets for nuclear to provide at least 20% of power generation requirements. This would result in a seven fold increase in current power output from nuclear facilities assuming a 2% pa growth rate in demand.

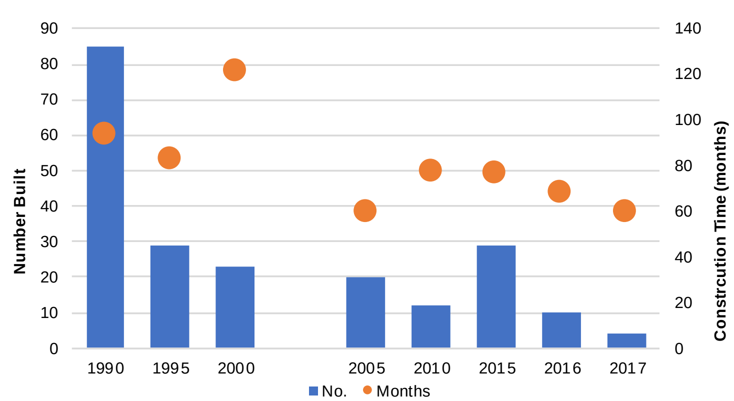
France: The government passed legislation in 2015 for the transition to a low-carbon economy, restricting nuclear power to its current level of capacity of 72% (Figure 9) with a goal of ultimately reducing the percentage of nuclear power to 50% by 2025 through increased deployment of renewable capacity. The average age of the 58 French reactors is 32 years, so some of the oldest globally. An aggressive replacement schedule over the next decade could have an impact on unit uranium demand due to first fill requirements. Neighbour Germany has recently moved to scale back all nuclear power (currently 11.3%) with renewables (36.3%) recently overtaking coal (35.1%) as the main source of energy generation.

USA: According to EIA data nuclear accounts for 19.7% of power generation, with the drop in coal fired power (to 30%) supplanted by natural gas (34%) with the balance of ~12% coming from renewables. While no new reactors have been built over the last twenty years, it is expected that the two reactors currently under construction at the Vogtle power plant in Georgia will come online over 2021 (noting however that the permitting process commenced in 2007, highlighting the protracted regulatory environment that exists in the US for nuclear facilities).

Despite the favorable running costs (~2.4c/kWh vs 3.4c/kWh for gas and 3.3c/kWh for coal), from 1992 to 2016 over thirty times more gas fired power capacity came online in the US, much of this owing to the advent of shale gas.

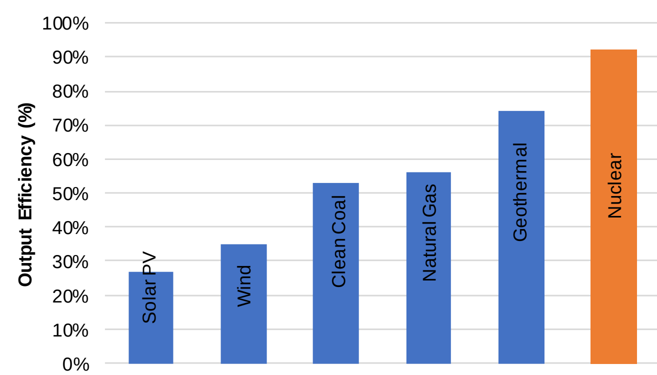
Continued low gas prices (<US$5/mmbtu) have reduced the incentive for constructing new nuclear power facilities. The advent of smaller, modular plants such as the Generation III and Generation III+ models may help overcome large capital investment decisions and provide a better fit with a more deregulated grid network.

Figure 11: Reducing construction times, but cost overruns do occur…



Source: IAEA

Figure 12: …however nuclear plants are highly efficient



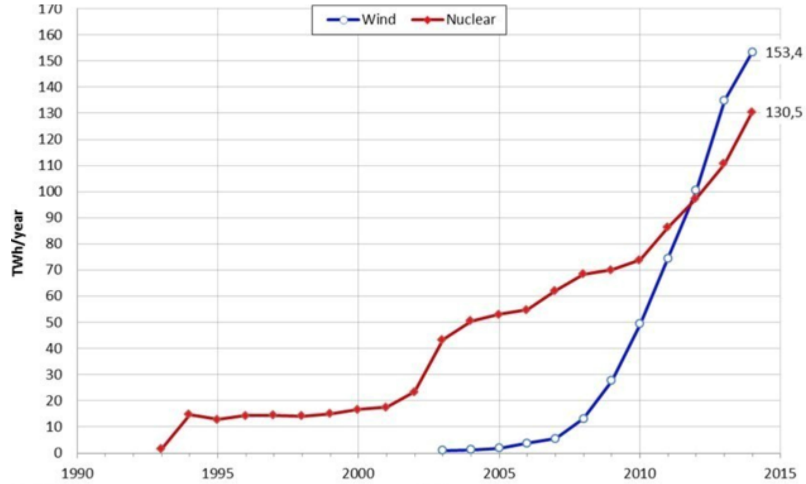
Source: IAEA

China: Of a total electricity generation of 6,000TW.h, nuclear accounted for ~3.9%, with with hydro (19.5%) and fossil fuels (72%) the dominant source of electricity production. Upon release of the 13th Five Year plan on Energy Development in 2017, the National Energy Administration provided a target of 15% of non-fossil fuel in primary energy production. Within this target, nuclear is expected to increase from ~36 GWe of capacity to 58 GWe by 2020.

Longer term non-fossil fuels were expected to provide 20% of primary energy by 2030 as part of its pledge to the United Nations in June 2015. To facilitate this, China plans to bring on line additional nuclear capacity between 2005 to 2020 of 3.4GWe/year and from 2020 to 2030 of 9.0GWe/year. We have incorporated these projections in our forecast Chinese U_3O_8 demand presented in Figure 15.

In anticipation of its growing future needs, China has been stockpiling uranium feedstock for the last decade. Based upon import data from the IEA, we estimate that China holds an inventory of ~280 mlbs of U_3O_8 which is equivalent to ~ 9 years of current domestic requirements. It is considered a stockpile as at this level it is critical to domestic energy security and presents as an important residual source of continued demand. Based on this, we expect additional purchasing of either primary or secondary feedstock in line with reactor built out (an additional ~2 mlbs/pa to 2020 and ~6 mlbs/pa from 2020 to 2030).

Figure 13: Historical Non-Fossil fuel composition in China : While Wind (and Solar) have rapidly been rolled out, Nuclear provides a direct base load source of electricity generation.



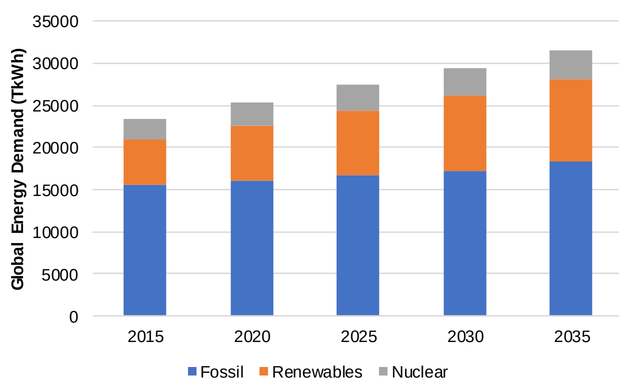
Source: BC Consulting

Putting together the demand outlook

The comparative low operating costs and negligible emissions of nuclear should position it as a key component of the future global energy mix. The latest EIA projections for global energy demand (Figure 14) suggest an overall increase of 35% in energy requirements from 2015 to 2035.

The EIA forecast nuclear power to continue to supply around 11% of requirements which implies a CAGR of 1.6% nuclear energy supply. We however view this as a conservative outlook given the announced build out of facilities in China as part of its transition to a lower carbon economy.

Figure 14: EIA forecast for world net electricity generation by fuel type (TkWh)



Source: EIA, June 2018

Projecting the upside demand scenario

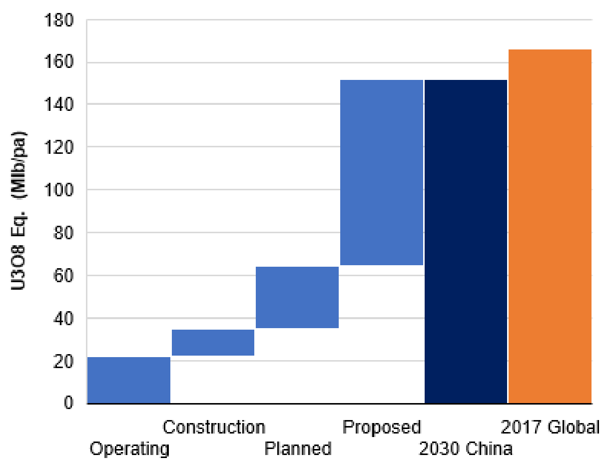
The commitment and subsequent pace of nuclear reactor build out in China is likely to present as the largest driver of both near and longer term demand out to 2030. We have used the latest projections from the IAEA presented in Figure 14 to project an un-risked uranium demand profile out to 2030. We make the following assumptions;

- All current reactors are expected to consume similar quantities of uranium for given power generations and we have ignored the strong likelihood that some of these facilities will be retired before 2030.
- We have applied a unit consumption of 2.3GWe/lb U_3O_8. across all our expected subsequent reactor build outs based upon 2017 electricity generation of

2,520TW.h, consuming 166 mlbs of U_3O_8. We note however that unit consumption is likely to be higher initially for "first fill" requirements for new reactors, offset by potential efficiencies that would eventuate.

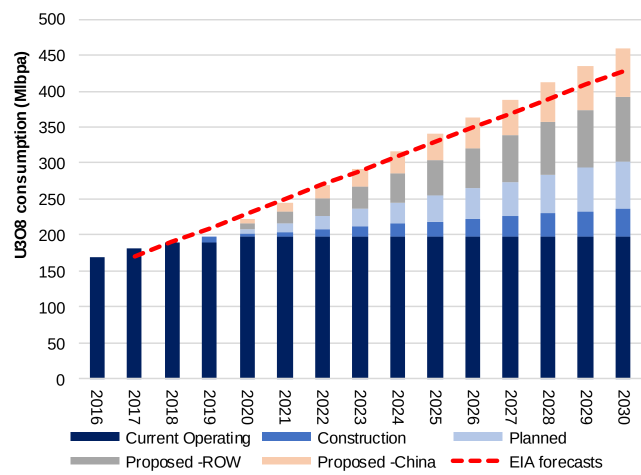
- For simplicity within our projections we have modelled a linear year on year increase towards target reactor build out. We assume all reactors "in construction" are built by 2025 and those planned or proposed are built by 2030. We have not risked any of these projections within our base case scenario.
- We also present in Figure 16 the resultant U_3O_8 demand to 2030 of 430 mlbs pa based upon the most recent EIA forecasts for nuclear power presented in Figure 14. This correlates quite closely to IAEA projections for global demand of 430 mlbs U_3O_8.
- We recognize that consumption and demand will be offset by a number of years due to obtaining secure supply of feedstock ahead of financing and developing reactor facilities. While there are inventory levels of ~6 years based on current demand, a key factor is how much of this is readily available.

Figure 15: Chinese forecast uranium demand to 2030



Source: Canaccord Genuity estimates, IAEA

Figure 16: Un-risked forecast demand from announced reactor build out



Source: IAEA, Canaccord Genuity estimates

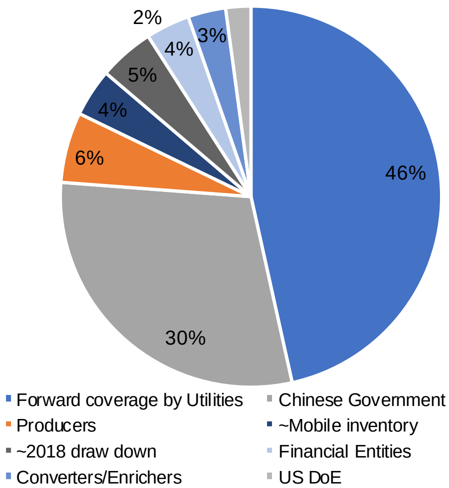
As various countries transition from planned to construction phase, we expect that feedstock will be sourced from supply that comes online from uncovered production from existing producers and any inventory that could be released from current stocks (Figure 4).

As production starts to shift towards a more uncovered basis it could be expected that a degree of competitive tension could exist as utility providers position themselves with forward sales agreements 2-3 years before actual consumption.

We understand that over 50% of utility providers will need to renegotiate longer term supply contracts over the next five years. This presents a potential conundrum for higher cost producer that may be unwilling to enter into new contracts that don't offer the same price protection as trailing contracts, putting production at risk. However if production is curbed too aggressively there may be upward pricing pressure from increases in demand.

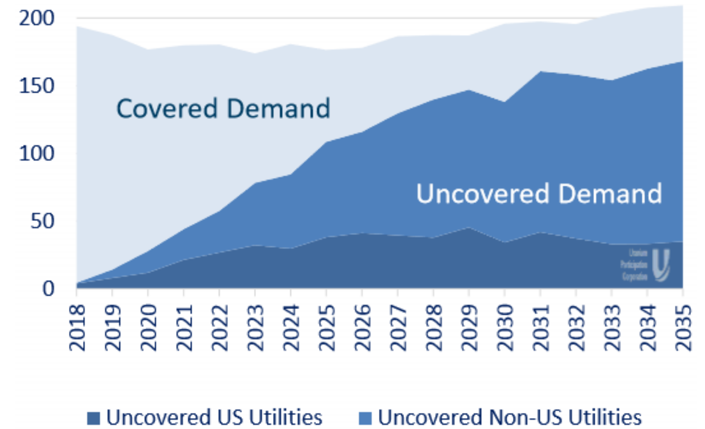
Depending on supply from secondary sources (~25% of market, see below) the renewal of supply to meet longer term supply contracts could have a positive effect on pricing, in our view.

Figure 17: Composition of current inventory



Source: Company Reports, Canaccord Genuity estimates

Figure 18: US Utilities forward orders



Source: Uranium Participation Corp Presentation May 2018

Figure 19: 2017 World Nuclear Electricity Profile sorted by uranium requirements

Country	Nuclear Electricity generated		Operable		Construction		Planned		Proposed		Uranium Required	
	TWh	%e	No.	MWe net	No.	MWe gross	No.	MWe gross	No.	MWe gross	tonnes U	U3O8 (Mlb)
USA	805	20	99	99647	2	2500	14	3100	21	30000	18996	49.37
France	379.1	71.6	58	63130	1	1750	0	0	0	0	9502	24.70
China	247.5*	3.9	39	35667	19	20459	41	48500	143	164000	8289	21.54
Russia	187.5*	17.8	37	28961	6	4889	25	27135	22	21000	5380	13.98
South Korea	141.1	27.1	24	22505	5	7000	0	0	6	8800	4730	12.29
Ukraine ‡	85.6	55.1	15	13107	0	0	2	1900	11	12000	1944	5.05
United Kingdom	63.9	19.3	15	8883	0	0	11	15600	2	2300	1772	4.61
Canada	96	14.6	19	13553	0	0	2	1500	0	0	1592	4.14
Germany	72.2	11.6	7	9444	0	0	0	0	0	0	1480	3.85
Spain	55.6	21.2	7	7121	0	0	0	0	0	0	1275	3.31
Sweden	63.1	39.6	8	8376	0	0	0	0	0	0	1188	3.09
Belgium	40	49.9	7	5943	0	0	0	0	0	0	987	2.57
India	34.9	3.2	22	6219	6	4350	15	11550	28	32000	843	2.19
Japan	29.1	3.6	42	39952	2	2756	9	12947	3	4145	662	1.72
Slovakia	14	54	4	1816	2	942	0	0	1	1200	651	1.69
Czech Republic	26.8	33.1	6	3904	0	0	2	2400	1	1200	649	1.69
UAE	0	0	0	0	4	5600	0	0	10	14400	627	1.63
Switzerland	19.5	33.4	5	3333	0	0	0	0	3	4000	497	1.29
Finland	21.6	33.2	4	2764	1	1720	1	1250	0	0	494	1.28
Hungary	15.2	50	4	1889	0	0	2	2400	0	0	349	0.91
Bulgaria	15.5*	34.3	2	1926	0	0	0	0	1	1200	327	0.85
Brazil	15.7*	2.7	2	1896	1	1405	0	0	4	4000	321	0.83
South Africa	15.1	6.7	2	1830	0	0	0	0	8	9600	279	0.73
Mexico	10.6	6	2	1600	0	0	0	0	3	3000	248	0.64
Pakistan	7.9	6.2	5	1355	2	2322	1	1170	0	0	217	0.56
Argentina	6.2*	4.5	3	1627	1	27	2	1950	2	1300	195	0.51
Romania	10.6	17.7	2	1310	0	0	2	1440	0	0	183	0.48
Iran	6.4	2.2	1	915	0	0	4	2200	7	6300	157	0.41
Slovenia	6	39.1	1	696	0	0	0	0	1	1000	141	0.37
Netherlands	3.3	2.9	1	485	0	0	0	0	0	0	82	0.21
Armenia	2.4	32.5	1	376	0	0	1	1060	0	0	77	0.20
WORLD**	**2519**	**11%**	**450**	**395157**	**58**	**63108**	**153**	**156132**	**333**	**381895**	**64134**	**166.68**

Source: IAEA

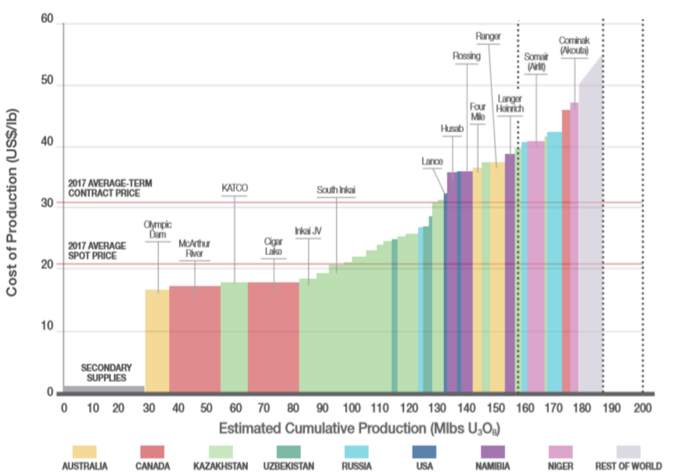
Of the 58 reactors under construction, 14-15 are expected to start up over 2018. This translates to an expected 3.5% growth pa in demand.

Supply

The current pricing environment has also slowed down the rapid expansion in supply from producers in Kazakhstan. Over the last decade Kazakhstan positioned itself as the world's leading uranium producer (Figure 21) with output increasing 16% since 2001 to over 60mlbs U_3O_8 in 2016. This rapid expansion was facilitated through the development of in-situ leach recovery (ISL) mines located in the Chu-Sarysu province in the central south of the country.

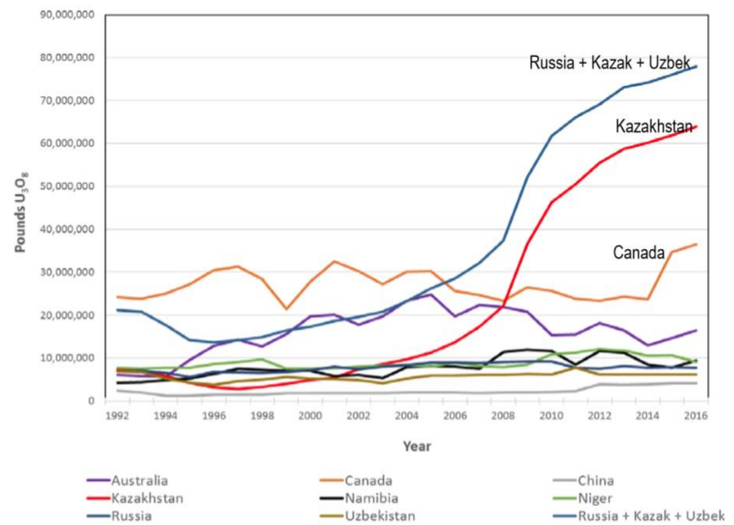
With over 30 years of industry experience in this technique, ISL offers Kazakh producers (70% are state owned) a distinct advantage in bringing on additional production at low costs, and more rapidly than competing hard rock mining projects. Figure 20 demonstrates the low quartile cost profile of these projects and the distinct margin advantage the operations have against the peer group.

Figure 20: 2016 Global Cost Curve



Source: Vimy Resources Presentation

Figure 21: Historical Mined Production – Kazakh production emerges



Source: UR Energy

Uranium production that has most recently emerged on the market has been concentrated within large state owned enterprises, Kazatomprom and CNNC, which have influenced contact volumes and integration to utility customers. It would be expected that as most incremental supply post Fukushima has been Kazah ISR production, this would be likely to have a lower realized sales price than legacy contracts that may have been struck in a rising price environment pre-Fukushima.

Figure 22: 2016 Mine Production Base by Operation

Mine	Country	Main owner	Mine type	Production (tU)		% of world production	
				2015	2016	2015	2016
McArthur River	Canada	Cameco	Conventional	7354	6945	12	11
Cigar Lake	Canada	Cameco	Conventional	4345	6666	7	11
Tortkuduk / Muyunkum	Kazakhstan	Areva	ISL	4109	4017	7	6
Olympic Dam	Australia	BHP Billiton	By-product (copper)	3179	3233	5	5
Inkai	Kazakhstan	Cameco	ISL	2234	2291	4	4
Somair	Niger	Areva	Conventional	2509	2164	4	4
Budenovskoye 2	Kazakhstan	Uranium One/Kazatomprom	ISL	2061	2081	3	3
South Inkai	Kazakhstan	Uranium One/Kazatomprom	ISL	2055	2056	3	3
Central Mynkuduk	Kazakhstan	Kazatomprom	ISL	1847	2010	3	3
Ranger	Australia	Rio Tinto/ERA	Conventional	1700	1994	3	3
Total from top mines				31,760	33,457	51	54

Source: World Nuclear Association

Figure 23: 2016 Production by company

Company	2016 production	
	Actual (tU)	World share (%)
Kazatomprom	12,986	21
Cameco	10,438	17
Areva	8433	14
ARMZ-Uranium One	7913	13
BHP Billiton	3233	5
CNNC/CGN	2672	4
Rio Tinto Uranium	2440	4
Navoi Mining	2404	4
Energy Asia	2308	4
Sopamin	1200	2
Paladin Energy	1310	2
General Atomics/ Quasar	1066	2
Sumitomo	1004	2
Sub-total	57,428	92
World total	62,221	100

Source: World Nuclear Association

Understanding Inventory

To understand supply and demand and the influence on price we first need to highlight inventory. Reactor requirements have outpaced global mined uranium supply for the last two decades with secondary supply and inventory draw down critical to supply needs.

A large inventory (in China up to seven years) is required to support the large scale build out of nuclear power. Since the uranium fuel cycle (Figure 28) can take over four years from mined product to nuclear fuel, maintaining pipeline inventories is critical.

We understand world inventories to be around 1 billion pounds of U_3O_8 equivalent, which is ~ 6 years of current consumption of ~180 mlbs pa. Of this about 50% is held by utilities, 30% by governments and 15% by suppliers, traders and financial participants. More specifically, for three years of forward coverage ~500 mlbs is expected to be held, while strategic inventories held by the Chinese government account for 260 mlbs and trader inventories 35 mlbs. Of non-commercial inventories, the US Department of Energy (DoE) is estimated to hold only a small quantity which is expected to be influenced by any potential change in US policy.

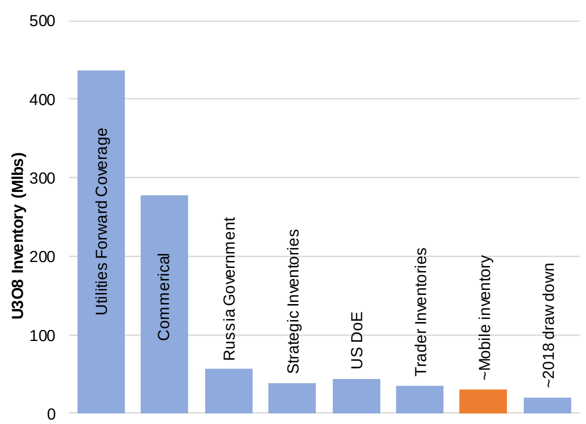
Of the remaining ~20% that is commercial inventories, we understand only a small portion (5-10%) is deemed 'mobile' (that is uncommitted and available for trade) at any given time and hence may curb the ability for uranium producers to be active in the spot market. We expect that the U_3O_8 spot market will be heavily influenced by the inventory situation over the near term.

To fulfil sales obligations many producers are using the recent decline in spot uranium pricing to make opportunistic purchases to underwrite mine suspensions and fulfil supply obligations. An example from three North America producers in Figure 25 highlights the participation of several producers in the market to exploit pricing arbitrage that exists between spot and forward terms.

More specifically Cameco's intention to prolong production cuts from McArthur River beyond 2018 was not met with a corresponding reduction in targeted sales. In a recent update on July 26th 2018, Cameco guided to ~9 mlbs of uranium production from its Cigar Lake operation with commitments to purchase 5-6 mlbs and deliver 25-27 mlbs. This will result in Cameco purchasing an additional 9-11 mlbs of uranium to meet delivery commitments based on a 12 month planning cycle to maintain target inventories of at least four months. At the start of 2018 Cameco indicated it had 2 mlb of inventory.

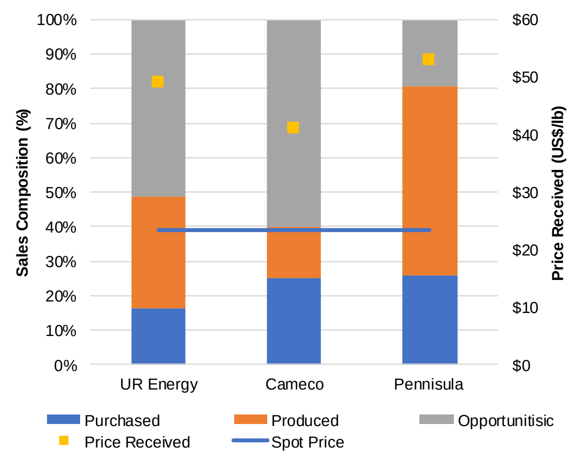
Cameco's recent market comments were that due to the relatively high fixed cost base it will not run MacArthur River unless it is at nameplate rate of 18mlbs pa. More specifically Cameco has highlighted that it will manage its forward sales obligations to avoid building excess inventory. This in turn feeds into its overall strategy to target a portfolio of long term contracts with 40% fixed prices and 60% market related prices.

Figure 24: Composition of current ~1.0b lb inventory



Source: World Nuclear news, Canaccord Genuity Estimates

Figure 25: Pro-forma 2018 Sales book



Source: Company Presentations, Canaccord Genuity Estimates

Mining Methods

Uranium is found in mineral deposits worldwide, with over half of the world's uranium production today derived from mines located in Canada, Australia, and Kazakhstan. Uranium-bearing ores are mined by methods similar to those used for other metal ores, however recovery methods are often hydrometallurgically complex requiring high levels of capital investment (Figure 27 below). Australia and Canada contain the largest level of mineral resources (Figure 26 below). The uranium ore is removed from the ground by conventional mining techniques, in-situ recovery method, or as a by-product of other minerals.

- Open pit: used to mine relatively shallow deposits such as those in Namibia and Niger. Underground: used to mine deposits too deep for open pit mining. For mining to be viable, these deposits must be comparatively high grade (+10% U).
- By-product: uranium often occurs in association with other minerals such as gold (South Africa), phosphates (USA and elsewhere) and copper (such as Olympic Dam in Australia).
- In situ leaching (ISL) recovers the minerals from it by dissolving them from the host rock, a sandstone-hosted uranium deposits located below the water table in a confined aquifer.

The uranium is dissolved in either sulfuric acid or a mildly alkaline solution that is injected into and recovered from the aquifer through wellfields. The uranium-bearing solution is then pumped back up to the surface, leaving the rock undisturbed. Consequently, there is little surface disturbance and no tailings or waste rock generated. However, the orebody needs to be permeable to the liquids used, and located so that they do not contaminate ground water away from the orebody.

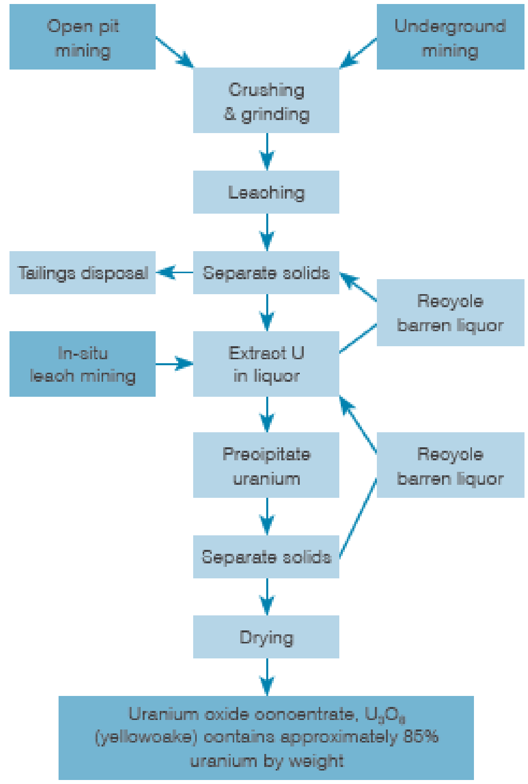
~20 ISL mines are in existence in Kazakhstan with a small number in operation in Australia and the US. These projects account for ~30% of global production and offer the lowest cost form of production. A more detailed description is provided in the Appendix 4 section here

Figure 26: Global uranium resources (contained uranium tonnes)

Country	2016 production (tU)	Uranium resources (tU)* <US$130/kg
Australia	6315	1,174,000
Brazil	44	155,100
Canada	14,039	357,500
China	1616	120,000
Czech Republic	138	1300
India	385	Not available
Kazakhstan	24,575	285,600
Malawi	0	8200
Namibia	3507	248,200
Niger	3479	325,000
Pakistan	45	Not available
Romania	50	3100
Russia	3004	216,500
South Africa	490	175,300
Ukraine	1005	84,800
USA	1125	207,400
Uzbekistan	2404	59,400
Other	0	277,500
Total	62,221	3,698,900

Source: World Nuclear Association

Figure 27: Recovery flowsheet for conventional recovery of U_3O_8



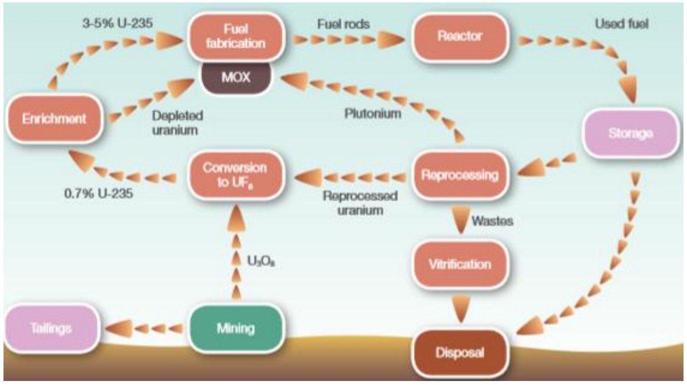
Source: World Nuclear Association

Secondary Supply

Another factor in the decline in mine production of U_3O_8 has been the influence of secondary (recycled) uranium supply. This market remains rather opaque and is therefore difficult to quantify. This is exacerbated by the lack of sensitivity to the prevailing U_3O_8 spot price on the flow of product into the market. Some forecasters highlight that supply voids that have recently occurred in mined supply may be filled by the secondary market.

Current sources of secondary market uranium include re-processed uranium, MOX (Mined Oxide Fuel containing ~93% uranium) and the waste by-products of the enrichment process. While estimates of the marginal cost of secondary supply are difficult to quantify, trends can be seen whereby a drop in prevailing price has coincided with a drop in secondary supply. This suggests that breakeven costs lie well above US$50/lb hence curbing the potential for large quantities of supply.

Figure 28: Uranium Fuel Cycle



Source: Vimy Resources Presentation

Figure 29: Uranium Enrichment Facilities (Uranium tonnes pa)

Country	Company and plant	2013	2015	2020
France	Areva, Georges Besse I & II	5500	7000	7500
Germany-Netherlands-UK	Urenco: Gronau, Germany; Almelo, Netherlands; Capenhurst, UK.	14200	14400	14900
Japan	JNFL, Rokkaasho	75	75	75
USA	USEC, Piketon	0*		
USA	Urenco, New Mexico	3500	4700	4700
Russia	Tenex: Angarsk, Novouralsk, Zelenogorsk, Seversk	26000	26578	28663
China	CNNC, Hanzhun & Lanzhou	2200	5760	10,700+
	Total SWU/yr approx	51550	58600	66700
	Requirements (WNA estimates)	**49154**	**47285**	**57456**

Source: World Nuclear Organisation.

Underfeeding

As a general concept it takes between 18-24 months for uranium product to transit through the uranium fuel cycle as shown in Figure 28. The U_3O_8 product contains trace (<1%) amounts of U_{235} which requires further enrichment to get to the standard U_{238} form. Enrichment facilities are likely to use latent capacity that exists to re-treat waste streams providing a potential source of additional secondary supply.

List of Market Comparable Companies

A list of uranium development projects are presented below. A key takeaway is that many of these projects are quite advanced (PFS or better) with several large scale operations at Cameco's McArthur River (CCO-TSX | Not Rated) and Paladin Energy's Langer Heinrich (PDN-ASX | Not Rated) currently on care and maintenance.

Figure 30: ASX and TSX listed Uranium advanced developers and producers (Local currencies, priced at 09/08/2018)

Exchange	Ticker	Company Name	Price	Market Cap	Enterprise Value	Primary Project	Location	Prod. (Mlbs/pa)
-AU	BMN	Bannerman Resources Limited	0.065	67	69	Etango	Namibia	7.2
-AU	VMY	Vimy Resources Limited	0.105	44	36	Mulga Rocks	Western Australia	3.5
-AU	TOE	Toro Energy Limited	0.026	56	66	Wiluna	Western Australia	1.9
-AU	BKY	Berkeley Energia Limited	0.74	191	183	Salamanca	Spain	3.5
-AU	BOE	Boss Resources Limited	0.069	109	112	Honeymoon Well	South Australia	3.2
-AU	PEN	Peninsula Energy Limited	0.305	71	88	Lance	USA	2.3
-AU	DYL	Deep Yellow Limited	0.37	72	60	Reptile	Namibia	NA
-AU	ACB	A-Cap Resources Limited	0.044	38	36	Letlhakane	Botswana	2.4
-AU	ERA	Energy Resources of Australia	0.405	210	-175	Ranger	Northern Territory	4.0
-AU	GGG	Greenland Minerals and Energy Limited	0.082	91	80	Kvanefjeld	Greenland	1.0
-AU	PDN	Paladin Energy Ltd	0.205	351	436	Langer Heinrich	Namibia	4.5
-CA	FSY	Forsys Metals Corp.	0.2	31	30	Norasa	Namibia	5.2
-CA	FCU	Fission Uranium Corp.	0.66	321	288	Triple R	Canada	7.2
-CA	NXE	NexGen Energy Ltd.	2.61	896	875	Arrow	Canada	18.5
-CA	GXU	GoviEx Uranium Inc Class A	0.21	83	87	Madaouela	Niger	23.0
-CA	AZZ	Azarga Uranium Corp. Class A	0.27	42	45	Dewey Burdock	South Dakota	1.0
-CA	CCO	Cameco Corporation	14.45	5719	6377	Cigar Lake	Canada	18.0
-CA	DML	Denison Mines Corp.	0.65	363	328	Wheeler River	Canada	6.6
-CA	EFR	Energy Fuels Inc.	4.32	380	356	Nicholas Ranch	USA	0.6
-CA	LAM	Laramide Resources Ltd.	0.275	36	44	Westmoreland	Queensland	
-CA	MGA	Mega Uranium Ltd.	0.14	41	40	Ben Lomond	Australia	
-CA	URE	Ur-Energy Inc.	0.95	139	152	Lost Creek	USA	0.3
-US	WWR	Westwater Resources Inc	0.327	17	15	Temrezli	Turkey	1.0
-US	UEC	Uranium Energy Corp.	1.74	279	286	Reno Creek	USA	
-CA	UEX	UEX Corporation	0.215	75	68	Horseshoe-Raven	Canada	2.4

Source: Company Reports, Canaccord Genuity estimates, FactSet (pricing date as of xx August 2018)

Other key considerations

Understanding Pricing

Uranium does not trade on an open market like other commodities. Buyers and sellers negotiate contracts privately and usually over lengthy periods (+5 years). As an example, in 2016 it was estimated that only 3% of the 37mlbsf uranium delivered to EU reactors were from the spot market.

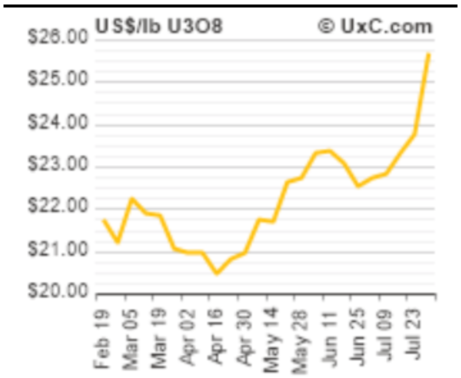
The main consumers of uranium are global utility companies and since there is no regulated or underwritten market for uranium, most supply is sourced on long term contracts with a smaller amount on the spot market. These are defined as purchases for delivery within a year. While long term prices are influenced by confidential terms relating to inflators, ceilings and floors the increasing activity of third party participants such as traders and financial institutions has started to provide more transparency to unit pricing.

Prices are published by independent market consultants Ux Consulting and TradeTech on a weekly and monthly basis for the settlement price for the long-term contract delivery of a number of uranium products. These include;

- Uranium (yellowcake, or U_3O_8),
- Uranium hexafluoride (UF_6) and
- the Uranium enrichment Separative Work Unit ("SWU") which defines the cost required to enrich uranium from U_{235} to U_{238}.

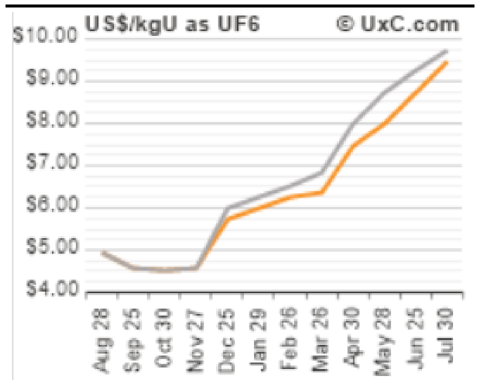
An illustration of all these prices YTD is provided below along with key trade terms.

Figure 31: U_3O_8 Price +25% in last 3 months



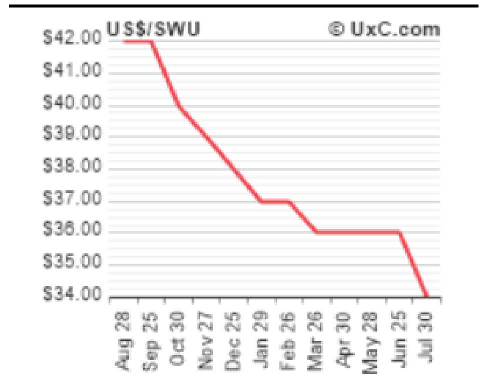
Source: Ux Consulting

Figure 32: UF_6 Price +100% in last 9 months



Source: Ux Consulting

Figure 33: SWU Price – 25% in last 9 months



Source: Ux Consulting

- The Ux U_3O_8 Price (Spot) includes conditions for delivery timeframe (<=3 months), quantity (>=100,000 pounds), and origin considerations, and is published weekly.
- The Ux 3-Year and 5-Year U_3O_8 Forward Prices reflect UxC's estimate of prices for U_3O_8 delivery 36 and 60 months forward taking into account market activity and other indicators, using the same quantity and origin specifications as spot.
- The Ux Conversion Prices consider offers for delivery up to twelve months forward (Spot) and base-escalated long-term offers (LT) for multi-annual deliveries with delivery in North America (NA) or Europe (EU).
- The Ux SWU Price (Spot) considers spot offers for deliveries up to twelve months forward for other than Russian-origin SWU.

Marketing strategies

Large producers such as Cameco engage in long term contracting with a current ratio of 40% fixed pricing and 60% market related, with protection for falling prices. Some of these mechanisms include:

- **Fixed-price contracts for uranium:** These are typically based on a term-price indicator at the time the contract is accepted with an escalation factor over the term of the contract. Since 1996, the long-term price indicator has averaged 21% higher than the spot price which is reflected in Figure 35.
- **Market-related contracts for uranium:** These are based on spot pricing and are quoted on a projection for at the time of delivery rather than at the time the contract is accepted. These contracts include floor prices and/or ceiling prices.
- **Fuel services contracts:** the majority of our fuel services contracts are at a fixed price per kgU, escalated over the term of the contract, and reflect the market at the time the contract is accepted.

Figure 34: Cameco realized uranium price sensitivity under various spot price assumptions

Spot prices ($US/lb U3O8)	$ 20	$ 40	$ 60	$ 80	$ 100	$ 120	$ 140
2019	32	43	56	65	74	81	87
2020	30	41	55	64	73	81	87
2021	27	41	55	66	75	84	92
2022	26	41	56	66	75	85	94

Source: Cameco

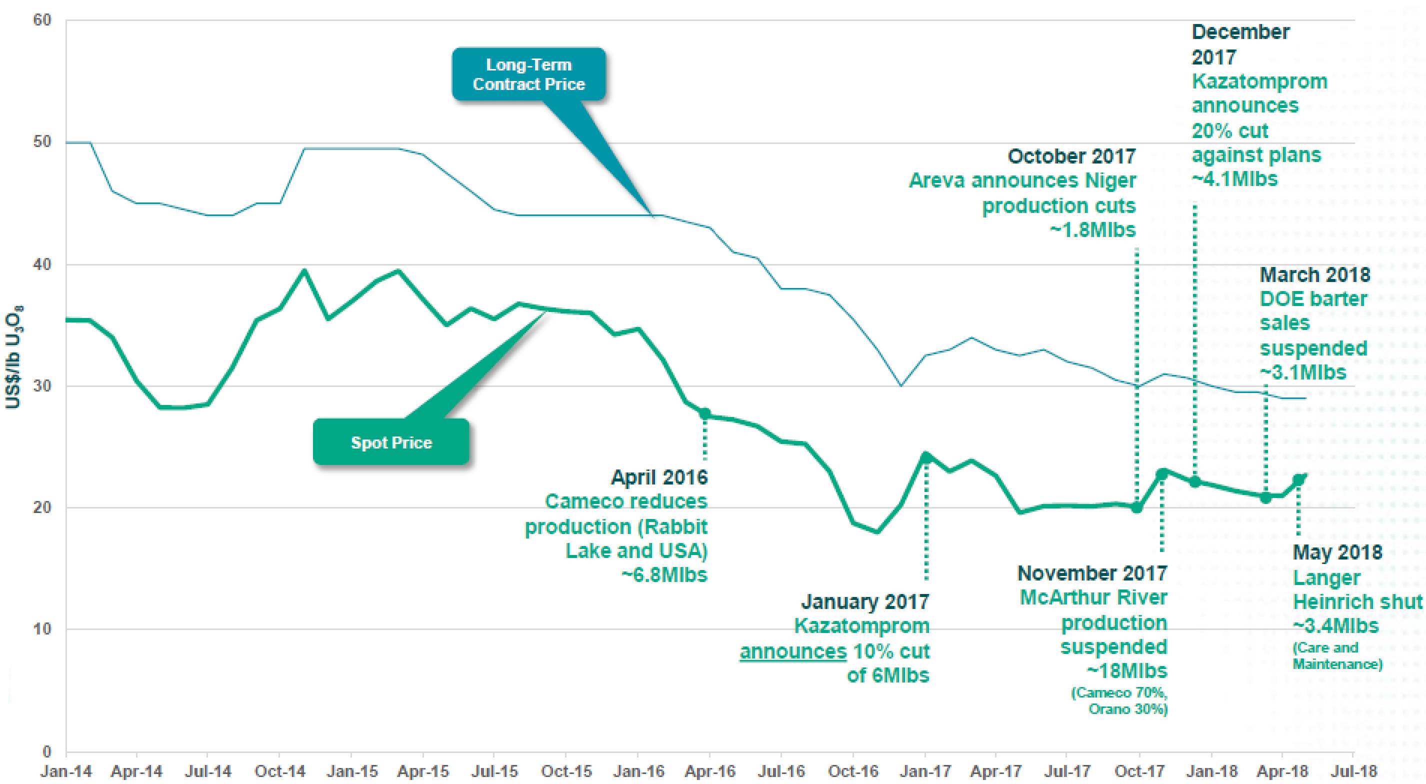
Long term vs spot pricing

As observed in Figure 35, the spot price has more recently become more sensitive to supply side cuts with the arbitrage to long term pricing decreasing as contracts roll off.

While it is difficult to quantify, CCO recently indicated that around 50 mlbs of total production (mined + secondary supply) of 140mlbs is freed up to enter the spot market and hence exposed to price manipulation through trading.

A practical example of this is when Berkeley Energia (BKY-ASX : $0.740 | NR) concluded a deal to sell uranium from its Salamanca project through a binding contract with trader Interalloys to supply 2 mlbs pa (and up to 3 mlbs pa) over five years at an average price of US$43.78/lb. This, at a time that the spot price was at multi year lows of ~ US$18/lb.

Figure 35: Spot and Long-term pricing (Jan'14 – July'18)



Source: Vimy Resources Presentation

Consumer type

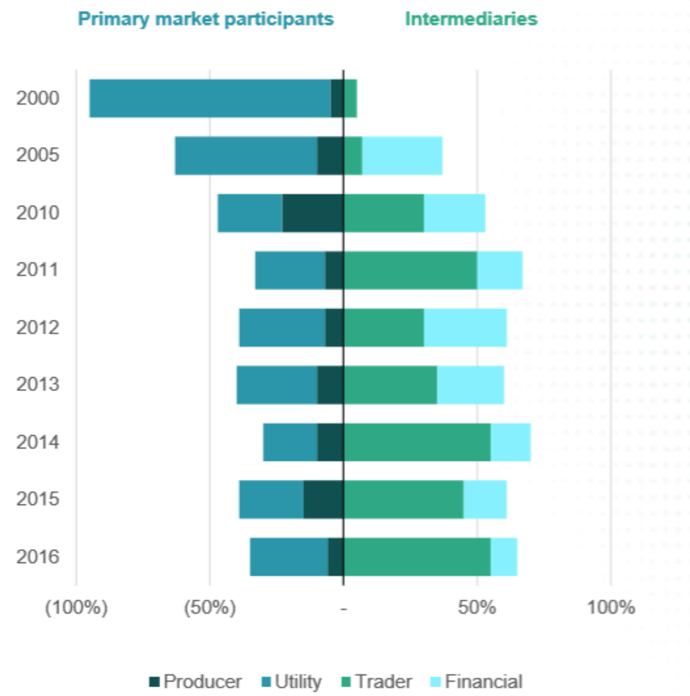
As indicated in Figure 17 there is an increased participation of traders and financial entities to purchase uranium units for subsequent on-selling or stockpiling. This contributes to the apparent supply levels that can be held for strategic purposes. A depiction of the changing participation mix is contained in Figure 36 below.

This highlights that an increasing proportion of sales have been directed away from utility providers during the period of depressed uranium pricing post Fukushima for potential deferred release to utility providers. This is consistent with our observation from Figure 8 of the propensity for underbuying by utilities which we expect to unwind as the effect of reactor build-out in China starts to draw upon built-up inventories.

In a similar fashion to Cobalt 27 (KBLT-TSX : C$6.62 | Spec Buy | Eric Zaunscherb, CG Corp. (Canada)) Yellow Cake plc (YCA-LSE : 224.00p | NR) have recently listed on the London Stock Exchange having raised £151.7 million to purchase and hold uranium. Yellow Cake has arranged for 6.84 mlbs in purchases over 2018, representing ~25% of Kazatomprom's annual production, or 5% of global production.

The agreement is long-term in nature, contemplating the delivery of up to $100m of uranium annually, at market related prices, for at least another nine years, subject to and upon completion of subsequent follow-on offerings by Yellow Cake and certain other conditions.

Figure 36: Consumer mix



Source: Vimy Resources Presentation

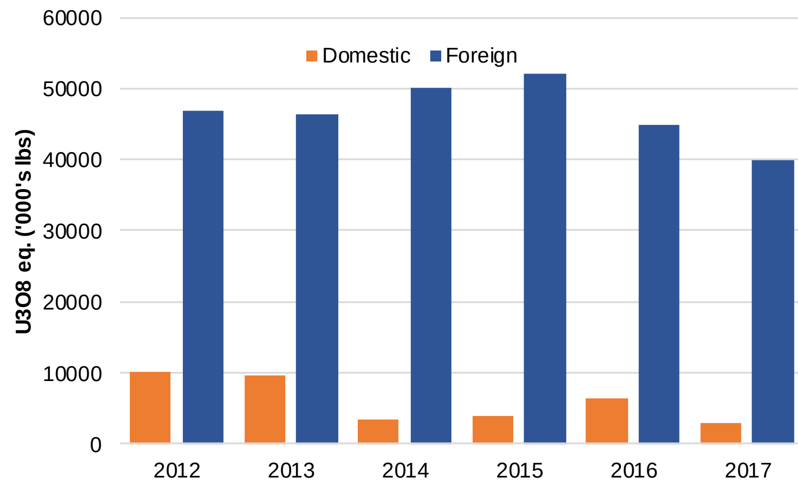
Potential US Trade Restrictions

In July 2018 the US Department of Commerce (DOC) launched an investigation into the security aspects of uranium imports under the broader review of the Section 232 of the Trade Expansion Act. It is expected that the Secretary of Commerce has 270 days to conclude the investigation with President Trump having 90 days to enact recommendations into law. Potential impacts on the uranium sector are:

- Near historic lows of domestic US production (falling 50% YoY) from the seven existing operations (Figure 37 below) due to the entry of low cost, state subsidized Kazakh and Russian production (Figure 21) over the last decade.
- Kazakh and Russia production fulfilled ~33%of US demand with domestic purchases falling in line with production at 50% YoY. We understand that domestic production only accounts for 7% of the 43 mlbs of U_3O_8 deliveries with the potential for this to reduce to only 2% over 2018.
- Safeguarding of domestic production through trade restrictions. This could be achieved by either/or;
  i) A quota to limit imports into the US, effectively reserving 25% of the US market (currently equivalent to ~12 annually) for domestic producers
  ii) Taxation measures such as an import duty like the 25% and 10% tariffs on steel and aluminium President Trump has recently proposed.

Depending on the timing for implementing any restrictions we view that underutilised US domestic supply may be slower to respond to fulfilling domestic requirements. This has the potential to draw further on US DoE inventory levels which we view could place tension on supply and potentially have a positive influence on spot pricing.

Figure 37: US Utilities Uranium sourcing



Source: SNL Mining

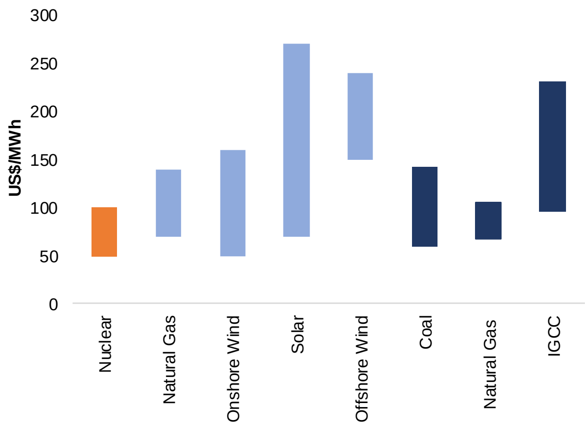
The role of nuclear energy in carbon abatement

Nuclear energy has extremely low direct (i.e., during operation) greenhouse gas emissions (Figure 39), high operating efficiencies (92% compared to ~53% for clean coal, Figure 12) and currently accounts for ~20% of low carbon electricity in OECD countries.

According to the Intergovernmental Panel on Climate Change (IPCC), global emissions amounted to ~ 27 gigatonnes of CO_2 from multiple sources, with electrical production accounting for ~37%. With electricity demand expected to increase by 43% over the next 20 years according to the latest EIA forecasts, nuclear power is projected to remain within the energy mix to support long term framework targets. These include the commitment by the European Union based on the 2016 Paris agreement to cut emissions by at least 40% below the 1990 level by 2030.

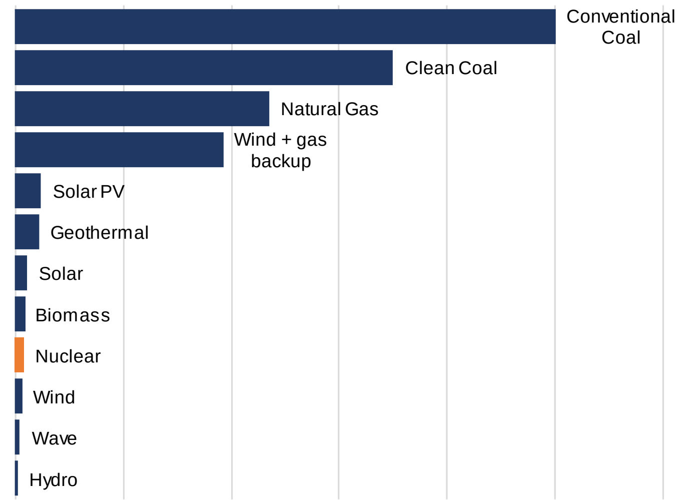
Nuclear energy remains one of the most cost competitive sources of energy when considering the levelized cost of energy (LOCE). This measure considers the unit cost of various sources of electricity over the lifetime of the generating asset and can provide an indication of the breakeven price for electricity sales.

Figure 38: Range of levelized cost of energy (LCOE) by source



Source: NEA

Figure 39: CO_2 Emissions by Energy Source (g/kWh)

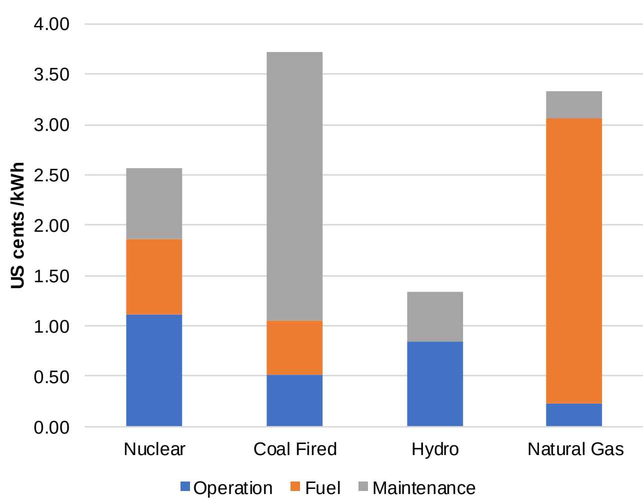


Source: Company Reports, IEA

The competitive cost position of nuclear energy is also further explained by the inelasticity of operating costs to any movements in spot pricing of uranium. As we eluded to, only 6% of EU utility customers are exposed to spot pricing with fuel requirements comprising approximately a third of operating costs.

This provides a level of certainty to regulators on pricing structures and also reduces the likelihood of any uplift in spot uranium price creating demand destruction.

Figure 40: Average power plant operating costs for major US electricity utilities (2015 estimates)



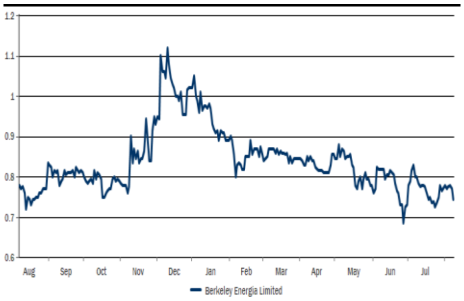
Source: GIS

Appendix I – Featured ASX-Listed Uranium Companies.

- **Berkeley Energia (BKY:ASX | NR)** - Fully funded to construct the next mine globally at Salamanca in Spain.
- **Boss Energy Resources (BOE:ASX | NR)** – Honeymoon Well: Low capex restart of a low cost Australian operation
- **Paladin Energy (PDN:ASX | NR)** – Repaired balance sheet with largest leverage to improved Uranium sentiment through a restart of its Langer Heinrich mine in Namibia.
- **Peninsula Energy (PEN:ASX | NR)** –Lance: The newest US domestic producer at the Lance project in Wyoming. Is it the benefactor of potential US trade policy changes?
- **Vimy Resources (VMY:ASX | TP: $0.50/sh, Rated Speculative Buy, Tim McCormack, CG Australia Ltd)** Mulga Rock: The most advanced Australian based uranium development project. Only one of four that are permitted for development.

Berkeley Energia (BKY:ASX)

Figure 41: BKY: ASX



Source: FactSet,

(BKY: ASX: A$0.74| M/Cap: A$191m | Not Rated)

We do not provide a rating, estimates, or a target price for Berkeley Energia

Overview

BKY is currently developing the Retortillo mine located in the Salamanca district of Spain with all capital expenditure (~US$92m) secured ahead of a two year construction period ahead of first production by 2020. Salamanca is expected to reach steady state production of ~4.4 mlbs pa by 2022, which could make it a top 10 global Uranium producer.

The Salamanca project has many favourable features that has seen it progress development and financing during challenging market conditions over the last five years. Some of these include shallow open pit mining (<120m depth), high ore grade from the Zona 7 deposit (630 ppm) and low cost grid power (<US$0.10/kWh). These all lead to a very competitive LOM C2 cash cost of US$17.15/lb. Perhaps more importantly the project is located within a region of excellent infrastructure, high skills base and low sovereign risk.

BKY has obtained all key licenses and permits with the main outstanding permit to convert land use to industrial purposes (known as an urbanism licence) expected over 2018.

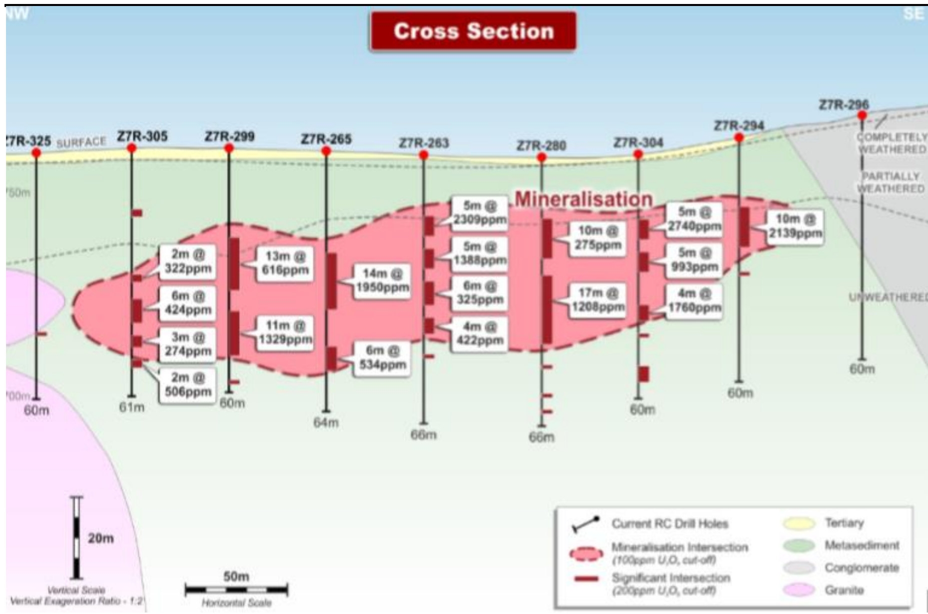
Figure 42: Salamanca Project Location map

Source: Company Reports

Geology

The Salamanca project consists of three distinct deposits which will be mined independently of each other. These include Retortillo, Zona 7 and Alameda. Zona 7 is a vein type uranium deposit hosted in a sequence of fine grained meta sediments which are overlain by a conglomerate unit and adjacent to a granite intrusive. The mineralized envelope is interpreted to be sub-horizontal to shallowly dipping and occurs from surface to maximum depth of approximately 100m. Uraninite and coffinite are the primary uranium minerals. Secondary uranium mineralization is developed in 'supergene-like' tabular zones corresponding to the depth of weathering.

Figure 43: Zona 7 Cross Section



Source: Company Reports

Reserves/Resources

The overall Mineral Resource Estimate (MRE) stands at 89.3 mlbs of U_3O_8. The proposed mine plan was based solely on Measured and Indicated Resources totalling 59.8 mlbs of U_3O_8. Mining is expected to be open pit in a continuous manner to limit overall site disturbance. Zona 7 material is expected to provide the highest grade plant feed and is scheduled from year 3 of operating pending receipt of approvals.

Figure 44: Resources

Deposit Name	Resource Category	Tonnes (Mt)	U_3O_8 (ppm)	U_3O_8 (Mlbs)
Retortillo	Measured	4.1	498	4.5
	Indicated	11.3	395	9.8
	Inferred	0.2	368	0.2
	Total	***15.6***	***422***	***14.5***
Zona 7	Measured	5.2	674	7.8
	Indicated	10.5	761	17.6
	Inferred	6.0	364	4.8
	Total	***21.7***	***631***	***30.2***
Alameda	Indicated	20.0	455	20.1
	Inferred	0.7	657	1.0
	Total	***20.7***	***462***	***21.1***

Source: Company Reports

Figure 45: Reserves

Deposit Name	Resource Category	Tonnes (Mt)	U_3O_8 (ppm)	U_3O_8 (Mlbs)
Retortillo	Proved	4.0	397	3.5
	Probable	11.9	329	7.9
	Total	***15.9***	***325***	***11.4***
Zona 7	Proved	6.5	542	7.8
	Probable	11.9	624	16.4
	Total	***18.4***	***595***	***24.2***
Alameda	Proved	0.0	0.0	0.0
	Probable	26.4	327	19.0
	Total	***26.4***	***327***	***19.0***
Total	***Proved***	***10.5***	***487***	***11.3***
	Probable	***50.3***	***391***	***43.4***
	Total (*)	***60.7***	***408***	***54.6***

Source: Company Reports

Processing

Mined ore will be treated by heap leaching and processed through a conventional circuit comprising of crushing, screening, agglomeration, stacking and heap leaching using on/off leach pads, followed by uranium recovery and purification by solvent extraction. Heap leaching recoveries are expected to reach ~88% with low sulphuric acid consumption which is a key driver of operation costs being highly attractive at US$15.39/lb for LoM.

Production is expected to ramp up towards 5 mlbs capacity as Zona 7 and Alameda have the potential to be brought online over ~12 years.

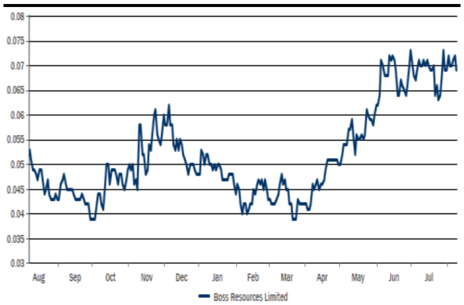
Capital Expenditure and Funding

Initial capital costs were estimated to be US$96m to commence production from the Retortillo deposit. Subsequent production from Zona 7 and Alameda is expected to require US$59m and US$80m in capital expenditure, respectively, as production is brought on from Year 3 (Zona 7) and Alameda (Year 5).

Over H2'17 BKY secured a strategic investment of up to US$120m with the Oman sovereign wealth fund. The first tranche of this facility for US$65m was received in November 2017. The investment comprises an interest-free and unsecured convertible loan note of US$65 million which can be converted into ordinary shares at 50 p/sh. upon commissioning of the mine, as well as an options package exercisable at an average price of 85 p/sh. contributing an additional US$55 million if exercised.

Boss Resources Limited (BOE:ASX)

Figure 46: BOE: ASX



Source: FactSet,

(BOE: ASX : A$0.07 | M/Cap: A$109m | Not Rated)

We do not provide a rating, estimates, or a target price for Boss Resources Limited

Overview

BOE's primary asset is the Honeymoon Well project located in South Australia, ~80km from the large mining town of Broken Hill which they acquired from Uranium One Australia in December 2015.

In addition to holding a mining lease and exploration licences, there exists infrastructure on site to the value of $170M which incorporates a 0.88 mlbs pa solvent extraction plant, which was placed on care and maintenance in early 2014 due to depressed uranium pricing and operating challenges associated with poor leach kinetics.

We visited the operation in July 2018 and observed that the plant was shut down in good order, ensuring restart risk is mitigated. The project is fully permitted and licensed for yellow cake shipment upon restart. It is expected that this can occur in less than 12 months with ~A$10m of capital expenditure for a 0.88 mlbs pa production rate. An upgrade to a 2.0 mlbs pa production rate can potentially occur through the installation of an ion-exchange plant. This upgrade, dependent on market conditions, is expected to cost $57m and take around 12 months to bring online.

Figure 47: Honeymoon Well Project Location map

Source: Company Reports

Geology

The uranium mineralisation is within a sandstone-hosted uranium roll-front model above an aquifer hosting uraninite (UO_2) and coffinite. Thickness of the paleochannels at the Honeymoon deposit area reaches a maximum of 55m. All Mineral Resources are located below the water table at the depth of only +/-100m. Other geological characteristics that need to be considered are highly saline groundwater (specifically chlorides) and the presence of small, but appreciable, amounts of calcite and pyrite /carbonaceous materials which impact gypsum formation and oxidant consumption respectively. The high chloride levels in the groundwater (~8-9g/l) originally resulted in the Honeymoon Well process plant incorporate solvent extraction ahead of a lower cost ion exchange circuit. Extensive test work (including a 4 month onsite pilot plant trial) has verified that ion exchange resins can be used in an upgraded recovery circuit.

Resources/Reserves

The current JORC resource at Honeymoon Well is 43.5Mt at 660ppm U_3O_8 for 63.3 mlbs which also includes the nearby Gould's Dam resource located 80km west of the Honeymoon Well project.

The Honeymoon Well deposit itself contains 15.2Mt at 820ppm U_3O_8 for 52.5 mlbs with the restart to commence in the high grade wellfield D.

A drill program has been proposed to infill existing drill holes and convert Inferred to Indicated Resources, and ultimately to Ore Reserves.

There exists good potential for exploration target of between 42-100 mlbs spread evenly across Eastern and Western tenements based upon significant historical intercepts (>1,000ppm U_3O_8) associated with well defined paleochannels of over 40km length.

Processing and Restart Study

In situ leach (ISL) process is well established with over ~20 ISL mines in operation in Kazakhstan alone. Previous operations at Honeymoon Well were impacted by lower than design extracted grades of U_3O_8 (~53mg/l vs budget 75mg/l) which directly impacted the production rates of uranium. In addition, lower than design leaching rates were as a result of gypsum precipitation and associated acid consumption.

The current process plant relies on solvent extraction which selectively extracts uranium minerals out of the generated PLS and is then stripped as per Figure 39. This solution is then precipitated, thickened dried and packaged as a yellow cake (an intermediate concentrated containing ~ 80% U). This flowsheet largely follows the same hydrometallurgical principles as other yellow cake production such as that at the Ranger operation in the Northern Territory.

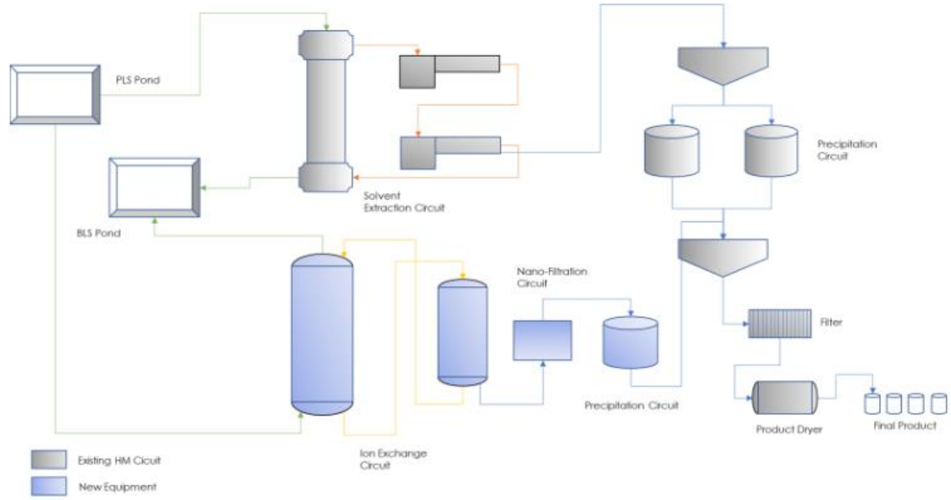
BOE has conducted detailed testwork with GR Engineering Services and ANSTO to determine the application of resins in the ion exchange circuit to augment the existing solvent extraction facility.

Stage 2 is designed to supplement the re-commissioned SX facility (Stage 1) with a new IX circuit, using a chelating resin, and associated processing infrastructure needed to process the additional PLS that will need to be generated from the Honeymoon wellfields for an expanded production of 2 mlbs pa U_3O_8. Total capital expenditure for this plant is expected to be ~A$57m.

Restart of the existing plant is expected to cost US$10m to resolve issues that affected previous operations including; booster pumps for wellfield injection, additional filtration steps and upgrading of water treatment facilities. It is expected that this work can be completed in ~nine months.

An expansion to 2.0 mlbs (Stage 2) will require installation of ion exchange, replacement of the existing precipitation circuit and upgrades to the product drying circuit. This work is envisaged to take place two years upon re-start to target 3.2 mlbs of production at an AISC of US$24/lb.

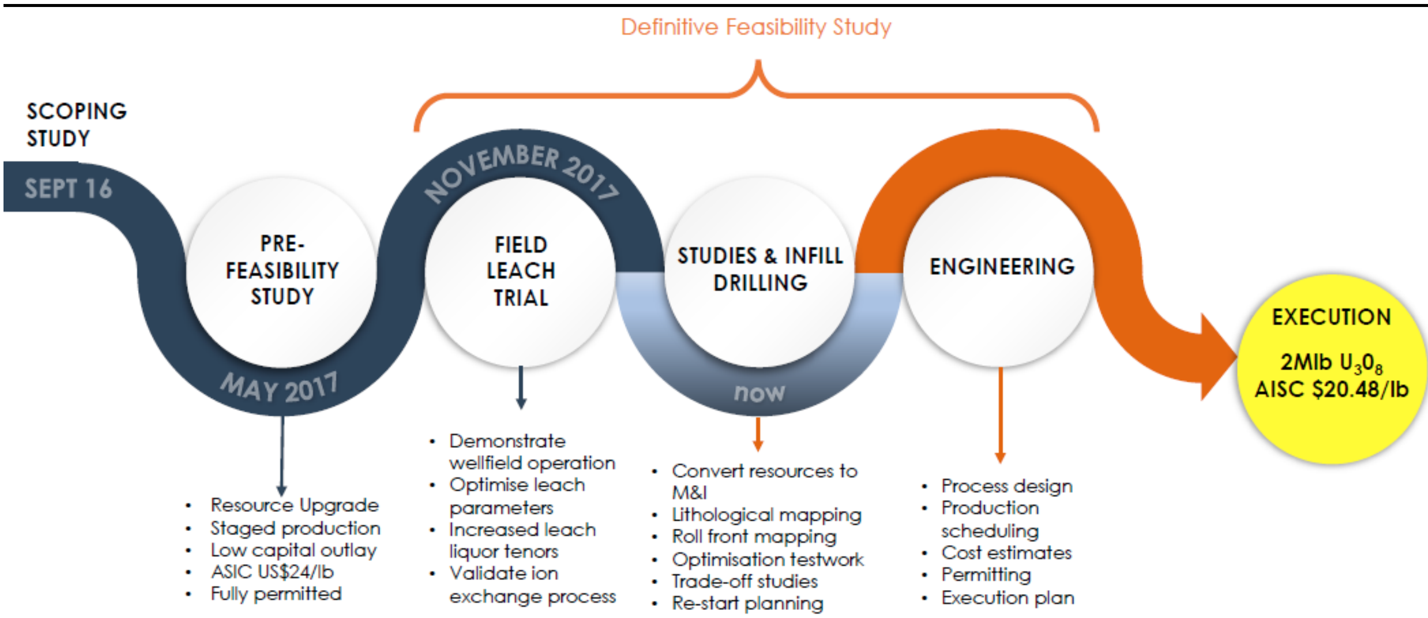
Figure 48: Process Flowsheet



Source: Company Reports

BOE is looking to commence resource drill out and plant capex optimisation studies over Q3’18. This is expected to culminate in a preliminary operational readiness plan to be delivered towards the end of Q4’18. Any future expansions will require updating of federal and state licenses and permits that the project currently possesses.

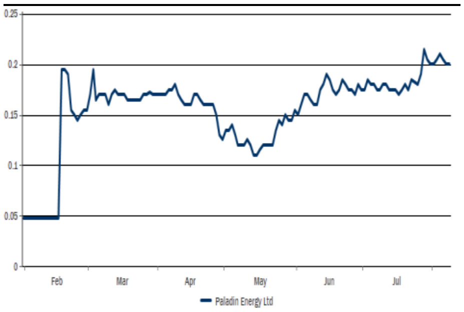
Figure 49: Honeymoon Well Restart plan



Expansion Study	Resource Upgrade	Pre-feasibility Study	Field Leach Trial	Acquire 100% Honeymoon	Drilling & Studies	Engineering & Planning	Quick Start	Redevelopment
✓	✓	✓	✓	✓	6 Months	6 Months	Year 1	Year 2

Source: Company Presentation, June 2018

Figure 50: PDN: ASX



Source: FactSet,

Paladin Energy (PDN:ASX)

(PDN: ASX: A$0.21 | M/Cap: A$351m | Not Rated)

We do not provide a rating, estimates, or a target price for Paladin Energy

Overview

PDN has recently been recapitalized through a major debt for equity swap that has addressed the rather precarious condition of its balance sheet. PDN went into administration in July 2017, with French creditor and offtake partner EDF calling in a US$277m loan.

Figure 51: DOCA key elements

Key components	Comment
2017 and 2020 Convertible Bonds	• Bondholders claim of US$391m exchanged into equity representing 40% of the existing equity. • Bondholders and acquirers of EDF claims provided the opportunity to fund the new secured notes of US$115m.
EdF	• Former EDF claim of US$288m exchanged into equity representing 30% of the existing equity.
DB Facility	• Drawn DB Facility of US$60m paid down to US$45m from cash on hand. • Balance of US$45m repaid from proceeds of new senior secured bond.
New funding	• Total new funding of US$115m in the form of a senior secured 10% PIK with a 9% cash toggle to fund liquidity for FY18 to FY21 assuming uranium price stays lower for longer. • In consideration for providing new money of US$115m, participating new funders receive a further 25% of the existing equity and their pro rata portion of the new secured bond. • For those participating new funders that commit to underwrite any shortfall of the new secured bond, they will receive a further 3% of the existing equity.

Source: Company Reports

Key elements of the recapitalisation are detailed above in Figure 51, in summary net debt has reduced from US$715m to US$44m with the average debt tenor extending from 1.5 to 5 years. Annual increase costs now revert to Pay-in-kind toggle notes of ~US$11.5m from cash interest of US$24.4m.

Paladin continues to own 75% of the Langer Heinrich Mine (LHM) in Namibia which along with the Kayelekera (100% owned) project in Malawi are currently placed on care and maintenance. A decision to re-start at LHM will require capital expenditure of US$35-45m along with an improvement in headline uranium pricing. While PDN has not indicated an exact required price to restart we note that it currently does not have to fulfil any future sales obligations and as such a decision to restart will be predicated on the pricing structure of future contracts entered into.

In a report prepared by UxC consulting in Sep'17, LHM was presented as the only operating open pit mine in the world with cash costs below US$30/lb for a 20+ year mine life demonstrating its tier 1 credentials.

PDN also holds several early stage uranium projects in Canada and Australia which combined place Paladin as a top five uranium company globally by resource ownership (447 mlbs of U_3O_8).

- Langer Heinrich Summary: Located 80km east of Walvis Bay in Namibia, commenced production in early 2007 with peak production of ~5.2 mlbs pa of U_3O_8. In Jan'14 PDN sold down 25% of LHM to CNNC for US$190m.
- Kayelekera Mine (KM) Summary: Located in Northern Malawi, the project was first acquired by PDN in 1998 with first production in April 2009. The project has a design capacity of 3.3 mlbs and operated until 2014 producing 10.7 mlbs of U308 during this period before production was suspended in May 2014.

Figure 52: Langer Heinrich Location

Source: Company Reports

Figure 53: Kayelekera Mine Location

Source: Company Reports

LHM Geology

Uranium mineralisation at Langer Heinrich is associated with the effect of calcrete (limestone) leaching with valley-fill fluvial sediments in an extensive tertiary palaeo drainage system. Uranium mineralisation occurs as carnotite, an oxidised uranium and vanadium secondary mineral. The deposit extends over a 15km length in 7 higher grade pods. Mineralisation is near surface, 1m to 30m thick and is 50m to 1,100m wide.

Reserves/Resources

LHM hosts Resources of ~127 mlbs of U_3O_8, with a high Reserve conversion rate (Ore Reserves of 91 mlbs of U_3O_8). Up to 20 % of the resource base is contained in lower grade stockpile material, resulting from mining ceasing in Nov'16. It is understood that stockpile processing can provide PDN with a lower cost method of restart if and when this occurs.

Figure 54: Langer Heinrich Mineral Resources

Mineral Resources depleted to 30th June 2017			
Class	Tonnes Mt	Grade ppm	Metal Mlb
Measured	60.7	513	68.72
Indicated	21.5	459	21.72
Total M+I	82.2	499	90.44
Inferred	8.7	468	8.98
Stockpiles	33.9	381	28.47
Mineral Reserves depleted to 30th June 2017			
Class	Tonnes Mt	Grade ppm	Metal Mlb
Proved	42.0	524	48.49
Probable	13.1	485	14.03
Stockpiles	33.9	381	28.47
Total	89.0	464	91.00

Source: Company Presentation

Processing

With uranium hosted within sediments at LHM, scrubbing is used to break down agglomerates into individual grains and to remove the uranium minerals from the grain surfaces. This along with a beneficiation circuit has the effect of removing 50% of barren ore feed to the leaching plant. Conventional leaching, ion exchange and precipitation is employed to produce a hydrogen peroxide product (UO_3). Several upgrades to the processing circuit have taken place since first production in 2007 to take production capacity to 5.2 mlbs pa.

Process Optimisation

PDN will continue to investigate a number of optimization projects with the view to increasing production efficiencies and lowering costs.

Several parts of the LHM processing circuit have been upgraded including the bicarbonate recovery plant and the back end upgrade project (BUP), which is aimed at lowering operating costs by US$4-5/lb upon re-restart. The BUP is expected take two years to implement and with a relatively low capex (TBC) and provide increased process stability.

In addition, PDN has commenced test work to feed low grade stockpiled material into the process plant. The *U-pgrade Project* will co-process up to 3Mt of low grade material which has the potential to increase production by 1.5-1.8 mlbs pa. PDN estimates this could reduce average costs by US$1-2/lb. No capital or development timeline has been provided at this stage.

Figure 55: Langer Heinrich Processing Plant

Source: Company Reports

Corporate Restructure Details

Most of the restructure completed over H2'17 was aimed at meeting the obligations that existed on a repayment of a US$277m prepayment signed in 2012 to Electricite de France S.A (EDF) that was due in July 2017.

In addition, PDN has issued two series of bonds:

- 2017 Bonds: Convertible bonds which mature at 30 April 2017 and bear a 6% p.a payable semi-annually in equal installments. Approximately US$212m was outstanding at 31 December 2017.
- 2020 Bonds: Convertible bonds mature on 31 March 2020 at 7% interest with approximately US$150m outstanding at 31 December 2017.

Lastly, prior to going into voluntary suspension, PDN engaged Deutsche Bank to provide LHM with a 12 month US$60m amended and restarted facility.

On 8 December 2017 PDN entered into a deed of company arrangement (DOCA) in which ~98% of PDN shares were issued to certain creditors and investors in exchange for the extinction of the majority of PDN's existing debts and the raising of US$115m in new funds.

This new US$115m bond issue comprises a 5 year term (bullet) and has a toggle between a 9% cash coupon and a 10% Payment in Kind (PIK) coupon. The cash coupon is only payable if:

- The operating cash flow minus maintenance capital expenditure for Paladin and its subsidiaries (on an attributable basis) for the 6 months preceding the interest payment date is US$5 million or more; and
- After payment of the interest, Paladin and its subsidiaries would have at least US$50 million in cash or cash equivalents

All elements of the recapitalization summarized in Figure 56 below were completed in Feb'18.

Decision to restart LHM

PDN is currently budgeting a US$35-45m working capital to restart LHM with annual sustaining capital during care and maintenance of US$3-4m.

While an improvement of U_3O_8 price will largely dictate restarting LMH, cost reductions from optimization projects (see above) are likely to determine unit economics. PDN is working through offtake arrangements to determine forward orders.

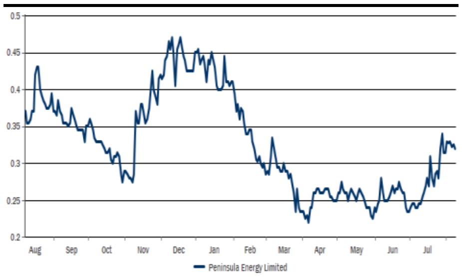
Figure 56: Paladin Pro-forma balance sheet post restructure.

US$(m)	Dec' 17	Debt to Equity	New Notes	Repay DB Facility	Pro-forma Feb'18
Current Assets	73		108	-65	116
Non Current Assets	376				376
Current Liabilities	762	-679		-63	20
Non Current Liabiliites	183		73		256
Net Assets/Total Equity	-496	679	35	-2	216

Source: Company Reports, Canaccord Genuity estimates

Peninsula Energy (PEN:ASX)

Figure 57: PEN: ASX



Source: FactSet,

(PEN: ASX : A$0.27 | M/Cap: A$63m | Not Rated)

We do not provide a rating, estimates, or a target price for Peninsula Energy.

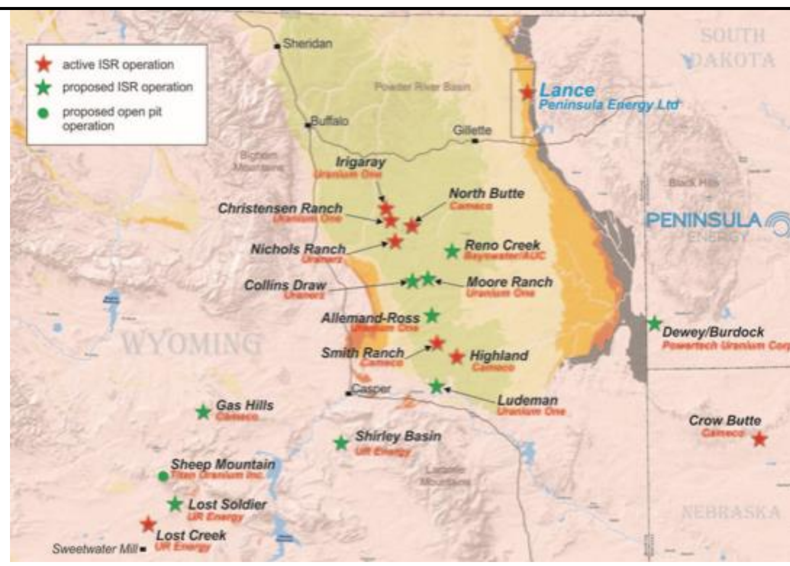
Overview

PEN have recently brought online the Lance in-situ recovery (ISR) project in Wyoming, USA in the Powder River basin, a region that includes large ISR operations such as Cameco's Smith Ranch project (accounts for ~50% of USA uranium production). Lance is fully permitted to produce up to 3 mlbs pa of product, having received the United States Nuclear Regulatory Commission's (NRC) authorization to begin in-situ uranium recovery in Dec'15.

Access to the project site is via the I-90 interstate highway and 8km of paved road, then 48km of graded roads. Lance also has three power lines crossing the project area which could be utilised for onsite power.

PEN acquired its interest in the Lance Uranium project in 2007 via cash-scrip deal with PacMag Metals for 200m PEN shares valued at ~A$18.7m. PEN completed a PFS in mid-2010 which validated the economics of an ISR operation producing yellowcake (uranium concentrate). The DFS was completed in late 2011 which outlined a 3-stage ISR uranium production operation producing 2.3 mlbspa U_3O_8. A subsequent Wellfield Optimisation Study (WOS) was completed in Sep'13 to develop a 2-stage 2.3 mlbspa U_3O_8 operation.

Figure 58: Salamanca Project Location map



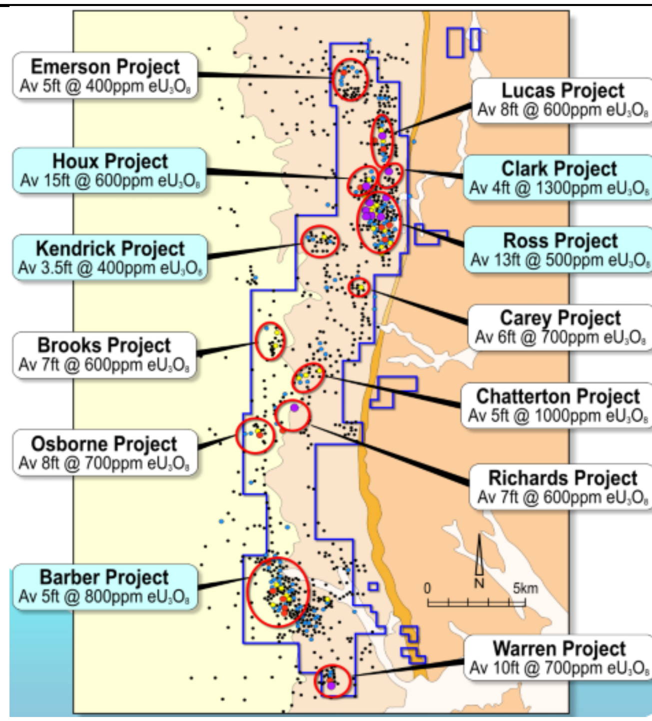
Source: Company Reports

Geology

The Lance project's uranium deposits are characterised as rollfronts, which form in the redox boundary at the sandstone/groundwater interface. Multiple mineralised horizons striking north-south have been identified within the complex system, of which 22 rollfronts have been mapped over 312 linear km (Figure 59). The average depth of the mineralised sandstone units are approximately 160m, with the depth gradually increasing towards the west due to dipping strata and increasing surface elevation.

Uranium mineralization is generally in the form of uraninite, coffinite or pitchblende. The deposits also contain vanadium, minor molybdenum and selenium.

Figure 59: Rollfront deposits identified at Lance



Source: Company Reports

Reserves/Resources

Since acquiring the project in 2007, PEN has progressively increased resources at Lance, from 15 mlbs of contained U_3O_8 in 2010 to the latest estimate of 53 mlbs of contained U_3O_8. The global resource at the Lance Project is classified into three production units (Ross, Kendrick and Barber), which form the base of production through the project's phased ramp-up. The initial ISR mining operation and the Central Processing Plant has been established at Ross.

Figure 60: Lance Resources

Classification	Tonnes (million)	U3O8(kg)	Grade (ppm U3O8)	U3O8(lbs)
Measured	3.7	2.0	489	4.3
Indicated	10.0	5.1	466	12.7
Inferred	37	17.5	463	36.5
Total	**50.7**	**24.6**	**473**	**53.5**

Source: Company Reports, Canaccord Genuity estimates

Mining

PEN initially commenced production using an alkaline base lixiviant at the Ross deposit within an in-situ leach circuit. In this recovery method an alkaline solution of sodium bicarbonate flows through the deposit, leaching the uranium, before being pumped to the surface for processing.

Each individual well array typically consists of a production (extraction) well surrounded by six injection wells and two monitor wells known as a Mining Unit (MU).

Over May 2018 alkaline base production at MU1 at Lance was suspended with alkaline based extraction continuing at M2 with a resultant decline in production rate from 120-160klbs pa to 100klbs pa.

The company has instigated a feasibility study on the application of low pH (acidic) operations which are expected to reduce operating costs by ~US$10/lb a year. PEN expects to receive environmental approvals for this by mid 2019.

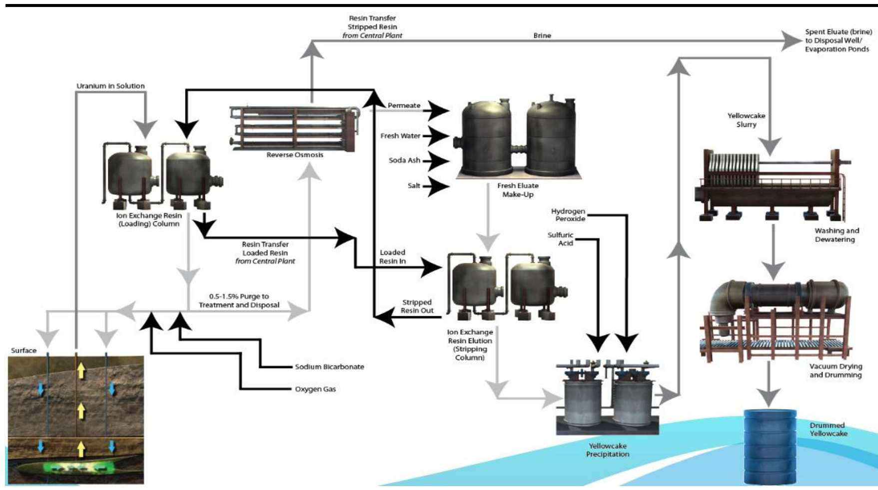
Processing

The CPP is a standard Ion-Exchange (IX) facility initially designed to treat 14.4GLpa of loaded well water, expanding to 28.9GLpa in year three of the operation to accommodate the Kendrick Production unit. In year seven a satellite plant will be constructed to treat lixiviate produced from the Barber production unit.

The loaded well water from the production modules is introduced to the IX columns where the uranium in solution is absorbed by Ion exchange resin. Once the resin is loaded to capacity it is transferred to the elution columns for stripping. Hydrogen Peroxide is added to the solution, precipitating the uranyl peroxide (yellow cake). Approximately 98% of the uranium in solution is recovered.

The yellowcake is washed, filtered, dried and drummed for shipment to a converter.

Figure 61: Lance Process Flowsheet



Source: Company Reports

US policy changes:

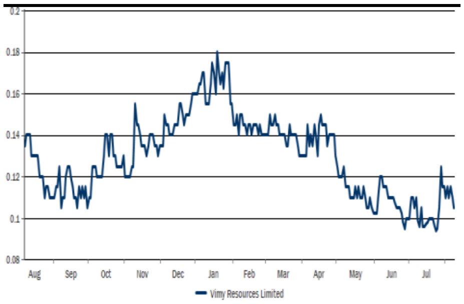
The US, under the guise of 'national security' is placing a temporary suspension on drawing down of the Department of Energy (DoE) stockpiles (~13% of total current inventory). Pending approval of the section 232 petition, a quota of 25% of consumption would be reserved from US uranium which has the potential to draw further on stockpiles.

This could also be exacerbated with any further import restrictions placed on imports from state backed production from Russia and former soviet states Kazakhstan and Uzbekistan which currently account for ~ 40% of US uranium consumption.

PEN is expected to use its position as one of the few domestic uranium suppliers to negotiate with utilities to increase realised prices above the US$50/lb it is currently receiving.

Vimy Resources (VMY:ASX)

Figure 62: VMY: ASX



Source: FactSet,

(VMY: ASX : A$0.10 | M/Cap: A$41m)

(Price Target: $0.50, Rated Speculative Buy by Tim McCormack)

Overview

VMY's primary asset is the Mulga Rock Project (MRP) in the Mt Morgans district of Western Australia ~300km east of Kalgoorlie. VMY holds all Ministerial approvals to carry out development and mining activities at the MRP, subject to endorsement of Mining Proposals and Works Approvals (State and Commonwealth) and secondary licences.

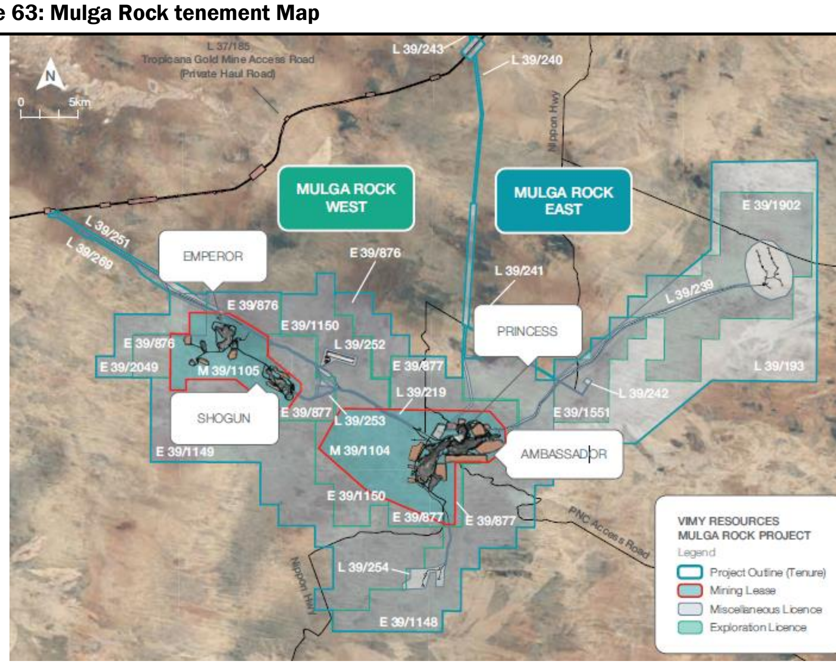
We have previously detailed the features of MRP in our initiation report here which have been further refined in the project pre-feasibility study (PFS), released in January 2018.

The MRP is one of the largest, advanced uranium development projects in Australia, with an Ore Reserve of 22.7Mt at 845ppm U_3O_8 for 42.3 mlbs U_3O_8. The Mineral Resource which stands at 71.2Mt at 570ppm U_{308} for a contained 90.1 mlbs U_3O_8 at a cut-off of 150ppm U_3O_8.

Since acquiring the project in 2007, VMY has increased the resource by +180% to 90.1 mlbs of U_3O_8 while at the same time receiving key environmental and regulatory approvals to progress the project. Receiving these over 2017 has been timely for VMY as the Western Australia government in 2017 placed a ban on any further projects other than the four that had previously been approved including Cameco's Kintyre and Yeelirrie project and Toro Energy (TOE:ASX|NR) Wiluna project.

This positions VMY favourably to commence discussions with potential offtakers and project financiers to advance the project.

Figure 63: Mulga Rock tenement Map

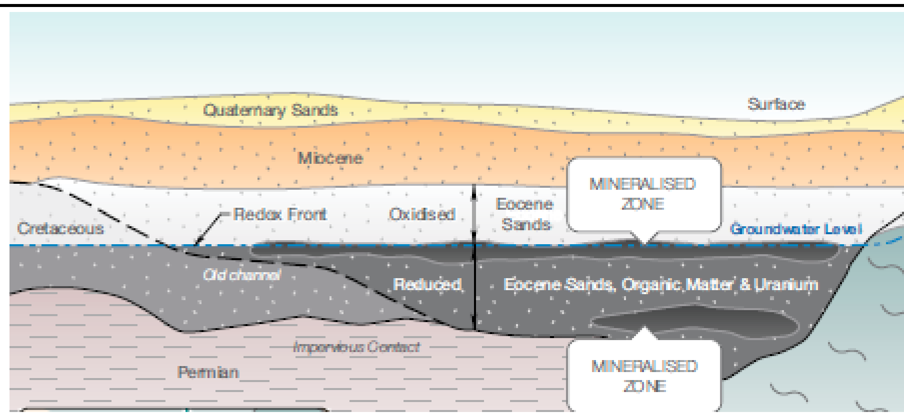


Source: Company Reports,

Geology

The Mulga Rock deposits are hosted in organic rich muddy sediments (lignite) within an Eocene buried paleochannel cut into sediments of the Narnoo Basin. Uranium mineralisation of the Ambassador, Shogun and Emperor Deposits are hosted on predominantly peat (lignite) and clayey peat below the redox boundary at the base of the weathered zone, generally close to the water table. The ore bodies are tabular in nature and generally between 20m-60m below the surface. Deep weathering is observed which provides soft friable rock amenable to free dig mining.

Figure 64: Mulga Rock stratigraphy highlighting ~40m of oxide layer



Source: Company Reports

Resources/Reserves

Mulga Rock has been extensively drilled to provide a JORC resource of 90.1 mlbs of contained U_3O_8 as indicated in Figure 65. Within the resource ~50% is classified as either measured or indicated with Ambassador containing ~58% of total contained U_3O_8. VMY has reported that there is a high-grade component within the Ambassador and Princess deposits containing 25 mlbs at 1,500ppm U_3O_8 which will provide initial plant feed.

Figure 65: Contained Mineral Resources

Deposit / Resource	Classification	Cut-off Grade (ppm U_3O_8)	Tonnes (Mt)[1]	U_3O_8 (ppm)[2]	U_3O_8 (Mlbs)
Mulga Rock East					
Ambassador	Measured	150	5.2	1,100	12.6
Ambassador	Indicated	150	14.8	800	26.0
Ambassador	Inferred	150	14.2	420	13.1
Princess	Indicated	150	2.0	820	3.6
Princess	Inferred	150	1.3	420	1.2
Sub-Total			**37.4**	**680**	**56.4**
Mulga Rock West					
Shogun	Indicated	150	2.2	680	3.2
Shogun	Inferred	150	0.9	290	0.6
Emperor	Inferred	150	30.8	440	29.8
Sub-Total			**33.8**	**450**	**33.6**
Total Resource			**71.2**	**570**	**90.1**

Source: Company Reports

Processing

VMY proposes to use a beneficiation plant to upgrade plant feed before subsequent hydrometallurgical processing for the production of Uranyl Peroxide. All test work has been independently verified across a suite of ore blends with third party verification (ANSTO) demonstrating the robustness of the flowsheet. Overall plant recoveries are expected to be around 87% for the average annual production of 3.5 mlbs U_3O_8 over 15 years at a AISC of US$34/lb U_3O_8.

Figure 66: DFS level process recoveries

Plant Area	% Uranium Recovery		
	Years 1-2	Years 3-8	Year 9-15
Ore Beneficiation	-	97.9	96.4
Leach-RIP-Elution	89.7	89.2	89.2
Uranium Precipitation	99.9	99.9	99.9
Overall Recovery	89.6	87.3	85.9

Source: Vimy Resources DFS Report

Pre-feasibility study outcomes

Below are the key cost estimates that VMY provided in the Jan'18 DFS for the MRP. Within its study VMY used a long term contract price of US$60/lb U_3O_8.

Figure 67: MRP capital costs (ASm)

Mining Fleet	90
Pre-strip	36
Mining Other	18
Process Plant	128
Plant infastructure	34
Site Infastructure	50
Indirect costs	79
Owners cost	35
Contingency	23
Total Capital	**493**

Source: VMY DFS Presentation

Figure 68: MRP operating costs (US$/lb)

Mining	11.73
Beneficiation	1.19
Reagents	4.34
Fixed process costs	10.69
Sustaining capital	2.36
Royalties	3.69
AISC	**34.00**

Source: VMY DFS Presentation

Potential project catalysts:

- Progress offtake contracts with utilities in the USA and Europe.
- Project finance: VMY has appointed Société Générale as its bank project finance advisor to assist with the development of MRP.
- Front end engineering and design (FEED) progression.

Appendix 2: Utilities information

Figure 69: Overview Of Power Reactors And Nuclear Share, 31 Dec. 2017

Country	Operational reactors		Reactors in long term shutdown		Reactors under construction		Nuclear electricity supplied in 2017	
	No. of units	Net capacity MW(e)	No. of units	Net capacity MW(e)	No. of units	Net capacity MW(e)	TW(e)·h	% of total
ARGENTINA	3	1633			1	25	5.7	4.5
ARMENIA	1	375					2.4	32.5
BANGLADESH					1	1080	NA	NA
BELARUS					2	2220	NA	NA
BELGIUM	7	5918					40.2	49.9
BRAZIL	2	1884			1	1340	14.9	2.7
BULGARIA	2	1926					14.9	34.3
CANADA	19	13554					95.1	14.6
CHINA	39	34514			18	19016	232.8	3.9
CZECH REP.	6	3930					26.8	33.1
FINLAND	4	2769			1	1600	21.6	33.2
FRANCE	58	63130			1	1630	381.8	71.6
GERMANY	7	9515					72.2	11.6
HUNGARY	4	1889					15.2	50.0
INDIA	22	6255			7	4824	34.9	3.2
IRAN,ISL.REP	1	915					6.4	2.2
JAPAN	42	39752			2	2653	29.3	3.6
KOREA,REP.OF	24	22494			4	5360	141.3	27.1
MEXICO	2	1552					10.6	6.0
NETHERLANDS	1	482					3.3	2.9
PAKISTAN	5	1318			2	2028	8.1	6.2
ROMANIA	2	1300					10.6	17.7
RUSSIA	35	26142			7	5520	190.1	17.8
SLOVAKIA	4	1814			2	880	14.0	54.0
SLOVENIA	1	688					6.0	39.1
SOUTH AFRICA	2	1860					15.1	6.7
SPAIN	7	7121					55.6	21.2
SWEDEN	8	8629					63.1	39.6

Source: IAEA April 2018

Figure 70: Operational Reactors And Net Electrical Power, 1990 To 2017

Country	Nuclear electricity supplied (TW·h) and percentage of nuclear share in given year															
	1990		1995		2000		2005		2010		2015		2016		2017	
	TW·h	% of total	TW·h	% of total	TW·h	% of total	TW·h	% of total	TW·h	% of total	TW·h	% of total	TW·h	% of total	TW·h	% of total
ARGENTINA	6.72	19.8	6.57	11.8	5.74	7.3	6.37	6.9	6.69	5.9	6.52	4.8	7.68	5.6	5.72	4.5
ARMENIA					1.84	33.0	2.50	42.7	2.29	39.4	2.57	34.5	2.19	31.4	2.41	32.5
BELGIUM	40.59	60.1	39.30	55.5	45.81	56.8	45.34	55.6	45.73	50.0	24.83	37.5	41.43	51.7	40.19	49.9
BRAZIL	2.06	1.0	2.33	1.0	5.59	1.9	9.20	2.5	13.77	3.1	13.89	2.8	14.97	2.9	14.85	2.7
BULGARIA	13.51	35.7	16.22	46.4	16.79	45.0	17.38	44.1	14.24	33.1	14.70	31.3	15.08	35.0	14.87	34.3
CANADA	69.87	14.8	93.98	17.3	69.12	11.8	86.83	14.5	85.50	15.1	95.64	16.6	95.65	15.6	95.13	14.6
CHINA			12.13	1.2	16.02	1.2	50.33	2.0	70.96	1.8	161.20	3.0	197.83	3.6	232.80	3.9
CZECH REP.	11.77	NA	12.23	20.0	12.71	18.7	23.25	30.5	26.44	33.3	25.34	32.5	22.73	29.4	26.78	33.1
FINLAND	18.13	35.1	18.13	29.9	21.58	32.2	22.36	32.9	21.89	28.4	22.33	33.7	22.28	33.7	21.57	33.2
FRANCE	297.61	74.5	358.71	76.1	395.39	76.4	431.18	78.5	410.09	74.1	419.04	76.3	386.45	72.3	381.85	71.6
GERMANY	139.37	33.1	146.13	29.6	160.66	30.6	154.61	26.6	133.01	22.6	86.81	14.1	80.07	13.1	72.16	11.6
HUNGARY	12.89	51.4	13.20	42.3	13.35	40.6	13.02	37.2	14.66	42.1	14.96	52.7	15.18	51.3	15.22	50.0
INDIA	5.29	2.2	6.99	1.9	14.23	3.1	15.73	2.8	20.48	2.9	34.64	3.5	35.01	3.4	34.90	3.2
IRAN,ISL.REP											3.20	1.3	5.92	2.1	6.37	2.2
JAPAN	187.19	27.1	275.51	33.4	306.24	33.8	280.50	29.3	280.25	29.2	4.35	0.5	17.54	2.2	29.29	3.6
KAZAKHSTAN			0.08	0.1												
KOREA,REP.OF	50.26	49.1	60.21	36.1	103.54	40.7	137.59	44.7	141.89	32.2	157.20	31.7	154.31	30.3	141.28	27.1
LITHUANIA	15.70	NA	10.64	86.1	7.42	73.9	9.54	70.3								
MEXICO	2.78	2.6	7.53	6.0	7.92	3.9	10.32	5.0	5.59	3.6	11.18	6.8	10.27	6.2	10.57	6.0
NETHERLANDS	3.29	4.9	3.78	4.9	3.70	4.3	3.77	3.9	3.75	3.4	3.86	3.7	3.75	3.4	3.26	2.9
PAKISTAN	0.38	1.1	0.46	0.9	0.90	1.7	2.41	2.8	2.56	2.6	4.33	4.4	5.44	4.4	8.11	6.2
ROMANIA					5.05	10.9	5.11	8.6	10.70	19.5	10.71	17.3	10.39	17.1	10.58	17.7
RUSSIA	109.62	NA	91.59	11.8	120.10	15.0	137.64	15.8	159.41	17.1	182.81	18.6	184.05	17.1	190.12	17.8
SLOVAKIA	11.16	NA	11.35	44.1	15.17	53.4	16.34	56.1	13.54	51.8	14.08	55.9	13.73	54.1	14.02	54.0
SLOVENIA	4.39	NA	4.57	39.5	4.55	37.4	5.61	42.4	5.38	37.3	5.37	38.0	5.43	35.2	5.97	39.1
SOUTH AFRICA	8.47	5.6	11.29	6.5	13.00	6.6	12.24	5.5	12.90	5.2	10.97	4.7	15.21	6.6	15.09	6.7
SPAIN	51.98	35.9	53.49	34.1	59.49	27.6	54.99	19.6	59.26	20.1	54.76	20.3	56.10	21.4	55.63	21.2
SWEDEN	65.27	45.9	67.17	46.6	54.81	39.0	69.58	44.9	55.73	38.1	54.46	34.3	60.65	40.0	63.06	39.6
SWITZERLAND	22.40	42.6	23.58	39.9	25.05	38.2	22.11	38.0	25.34	38.0	22.16	33.5	20.30	34.4	19.59	33.4
UK	58.77	19.7	70.64	25.4	72.99	21.9	75.34	20.0	56.85	15.6	63.89	18.9	65.15	19.3	63.89	19.3
UKRAINE	71.26	NA	65.78	37.8	72.56	47.3	83.40	48.5	83.95	48.1	82.41	56.5	76.08	52.3	80.41	55.1
USA	578.08	20.6	673.52	22.5	755.55	19.8	783.35	19.3	807.08	19.6	798.01	19.5	805.96	19.7	805.65	20.1
WORLD	1890.35		2190.94		2443.85		2626.34		2629.82		2441.34		2477.30		2502.88	

Source: IAEA, April 2018

Appendix 3: Market Comps

Figure 71: ASX and TSX Uranium Developers – Priced at 09/09/2018

Exchange		Ticker	Company Name	Price	Market Cap	Cash (Est)	Debt (Est.)	Enterprise Value	Liquidity 3M	Primary Project	Location	Ownership	Study Level	Date	Capex (US$m)	LOM Opex (US$/lb)	Resources (Mlbs)	Prod. (Mlbs/pa)
-AU	BMN-AU	BMN	Bannerman Resources Limited	0.065	67	2	4	69	6.2%	Etango	Namibia	95%	DES + HL demo plant	Nov'15	793	38	271	7.2
-AU	VMY-AU	VMY	Vimy Resources Limited	0.105	44	7	0	36	17.6%	Mulga Rocks	Western Australia	100%	DFS + trial mining	Jan'18	354	28	90	3.5
-AU	TOE-AU	TOE	Toro Energy Limited	0.026	56	5	15	66	1.8%	Wiluna	Western Australia	100%	PFS	Jan-14	221	31	84	1.9
-AU	BKY-AU	BKY	Berkeley Energia Limited	0.74	191	105	98	183	9.8%	Salamanca	Spain	100%	Construct	Jul-05	235	15	89	3.5
-AU	BOE-AU	BOE	Boss Resources Limited	0.069	109	1	4	112	5.8%	Honeymoon Well	South Australia	100%	PFS	May-17	146	20	111	3.2
-AU	PEN-AU	PEN	Peninsula Energy Limited	0.305	71	11	27	88	9.4%	Lance	USA	100%	Production	Mar-14	146	30	54	2.3
-AU	DYL-AU	DYL	Deep Yellow Limited	0.37	72	13	0	60	3.3%	Reptile	Namibia	100%	Pre-scoping				95	NA
-AU	ACB-AU	ACB	A-Cap Resources Limited	0.044	38	3	0	36	0.3%	Letlhakane	Botswana	100%	Scoping	Sep-15	351	41	366	2.4
-AU	ERA-AU	ERA	Energy Resources of Australia	0.405	210	385	0	-175	1.2%	Ranger	Northern Territory	65%	Production				38	4.0
-AU	GGG-AU	GGG	Greenland Minerals and Energy Limited	0.082	91	11	0	80	10.6%	Kvanefjeld	Greenland				832	254	350	1.0
-AU	PDN-AU	PDN	Paladin Energy Ltd	0.205	351	68	153	436	11.5%	Langer Heinrich	Namibia	75%	C+M	Jan-18	465		360.8	4.5
-CA	FSY-CA	FSY	Forsys Metals Corp.	0.2	31	0	0	30	1.0%	Norasa	Namibia	100%	PFS/DFS	Mar-15	433	35	183	5.2
-CA	FCU-CA	FCU	Fission Uranium Corp.	0.66	321	33	0	288	3.1%	Triple R	Canada	100%	Scoping/PEA	Sep-15	880	14	141	7.2
-CA	NXE-CA	NXE	NexGen Energy Ltd.	2.61	896	158	136	875	5.3%	Arrow	Canada	100%	Scoping/P EA	Jul-17	952	7	302	18.5
-CA	GXU-CA	GXU	GoviEx Uranium Inc Class A	0.21	83	6	11	87	3.2%	Madaouela	Niger	100%	PFS	Aug-15	359	24	139	23.0
-CA	AZZ-CA	AZZ	Azarga Uranium Corp. Class A	0.27	42	0	3	45	0.3%	Dewey Burdock	South Dakota	100%	PEA	Aug-15	27	12.53	12	1.0
-CA	CCO-CA	CCO	Cameco Corporation	14.45	5719	837	1495	6377	9.9%	Cigar Lake	Canada	55%	C+M	Jan-18			1073	18.0
-CA	DML-CA	DML	Denison Mines Corp.	0.65	363	36	0	328	3.3%	Wheeler River	Canada	63%	PEA	Jun-16	436.8	19.01	141	6.6
-CA	EFR-CA	EFR	Energy Fuels Inc.	4.32	380	57	33	356	3.8%	Nicholas Ranch	USA	100%	Production				112	0.6
-CA	LAM-CA	LAM	Laramide Resources Ltd.	0.275	36	0	8	44	6.0%	Westmoreland	Queensland	100%	PEA	Apr-16	451	13.81	52	
-CA	MGA-CA	MGA	Mega Uranium Ltd.	0.14	41	1	0	40	3.6%	Ben Lomond	Australia						17	
-CA	URE-CA	URE	Ur-Energy Inc.	0.95	139	10	22	152	0.7%	Lost Creek	USA		Production				28	0.3
-US	WWR-US	WWR	Westwater Resources Inc	0.327	17	2	0	15	24.8%	Temrezli	Turkey	100%	PFS	Feb-15	41	17	13	1.0
-US	UEC-US	UEC	Uranium Energy Corp.	1.74	279	12	19	286	27.7%	Reno Creek	USA		Production		Pre-scoping			
-CA	UEX-CA	UEX	UEX Corporation	0.215	75	7	0	68	3.3%	Horseshoe-Raven	Canada	100%	PEA	Feb-11	116	44	35.044	2.4

Source: Company Reports, Canaccord Genuity estimates

Appendix 4: Description of In Situ Leaching

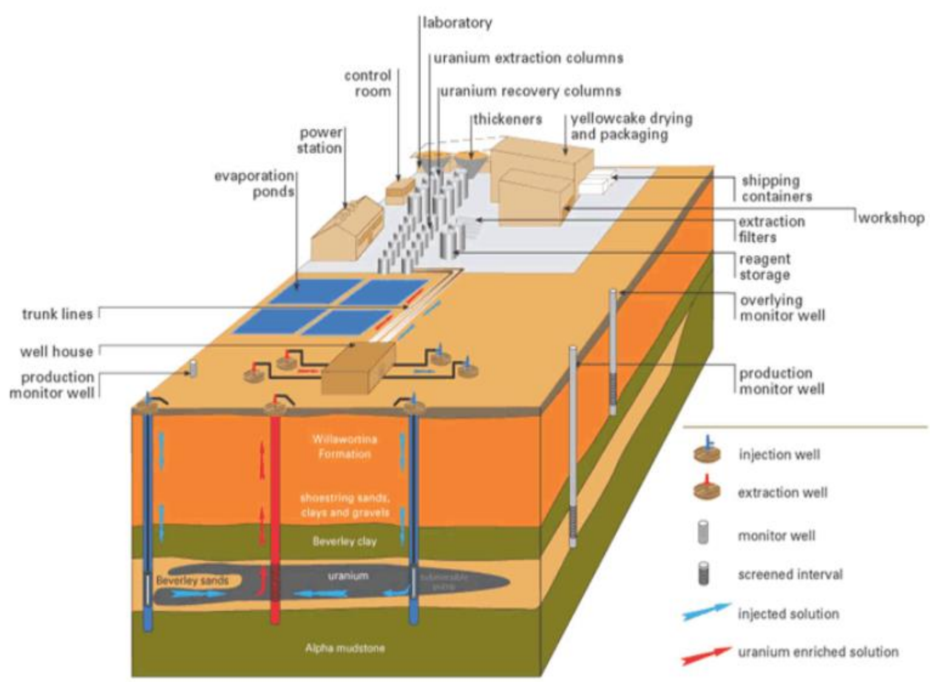
In situ leaching (ISL) recovers the minerals from the resource by dissolving them and pumping the pregnant solution to the surface where the minerals can be recovered. ~20 ISL mines are in existence in Kazakhstan. Consequently there is little surface disturbance and no tailings or waste rock generated. However, the orebody needs to be permeable to the liquids used, and located so that they do not contaminate ground water away from the orebody.

Uranium ISL uses the native groundwater in the orebody which is dosed with a complexing agent and in most cases an oxidant (ferric sulphate) It is then pumped through the underground orebody to recover the minerals in it by leaching. Once the pregnant solution is returned to the surface, the uranium is recovered in much the same way as in any other uranium plant (mill).

In Australian ISL mines (Beverley and the shut Honeymoon Well) the oxidant used is hydrogen peroxide and the complexing agent sulfuric acid. Oxidants are important to maintain redox conditions and control the risk of formation of iron sulphates such as Jarosite.

Kazakh ISL mines generally do not employ an oxidant but use much higher acid concentrations in the circulating solutions. ISL mines in the USA use an alkali leach due to the presence of large quantities of acid-consuming minerals such as gypsum and limestone in the host aquifers. Figure 72 shows a pictorial representation of the ISL process.

Figure 72: ISL Schematic Diagram



Source: World Nuclear Association

Factors on Uranium Recovery:

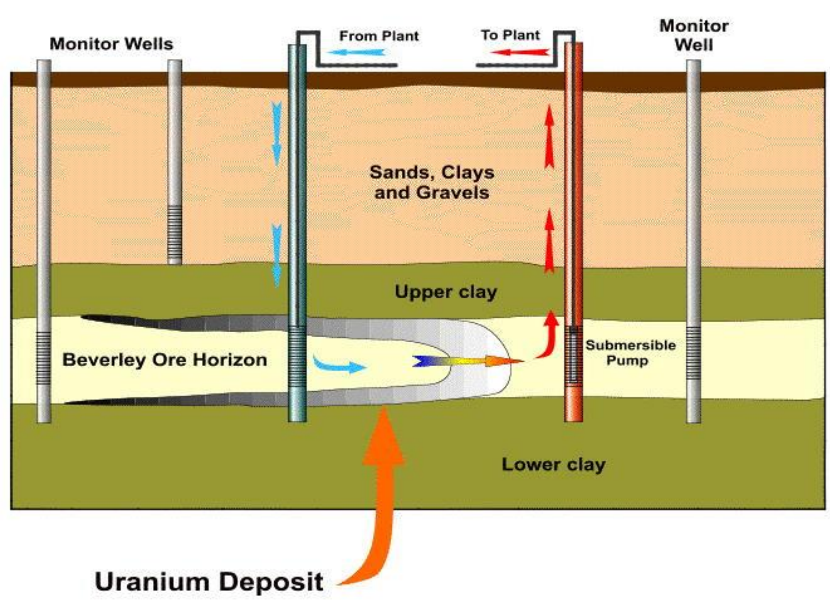
There are two operating regimes for ISL, determined by the geology and groundwater. If there is significant calcium in the orebody (as limestone or gypsum, more than 2%), alkaline (carbonate) leaching must be used. Otherwise, acid (sulfate) leaching is generally better. In this case the leach solution is at a pH of 2.5-3.0. Acid leaching gives higher uranium recovery – 70-90% – compared with 60-70% for alkaline leach, and operating costs are about half those of alkaline leaching.

In both the acid and alkali leaching methods the lixiviant is pumped into the aquifer via a series of injection wells where it slowly migrates through the aquifer, leaching the uranium bearing host sand on its way to strategically placed extraction wells where submersible pumps pump the liquid to the surface for processing. The closer these are placed the greater the rate of extraction.

Uranium deposits suitable for ISL occur in permeable sand or sandstones, confined above and below by impermeable strata, and which are below the water table. They may either be flat, or "roll front" – in cross section, C-shaped deposits within a permeable sedimentary layer. (see Figure 73).

Sandstone-hosted uranium deposits account for approximately 18% of world uranium resources and 7% of Australia's total uranium reserves and resources. In almost all cases the formation of sandstone-hosted uranium deposits occurs when uranium, transported in oxygen-rich groundwater, interacts with a reduced host rock. The resulting mineralization is fine-grained (often less than 20 microns) and comprises reduced uranium species; readily soluble uraninite [UO_2] and coffinite [$U(SiO_4)0.5(OH)_2$] are the most common. In either case the pregnant solution from the production wells is pumped to the treatment plant where the uranium is recovered in a resin/polymer ion exchange (IX) or liquid ion exchange (solvent extraction – SX) system.

Figure 73: Uranium Extraction at Beverly Operation



Source: World Nuclear Association

Surface Plant

Ion Exchange (IX) is most popular in Kazah ISL operations and uses active resins/polymers to selectively load contained uranium before eluting (stripping) as an enriched solution (eluate). In situations where the groundwater has a high chloride (>5-6 g/L) level or nitrates, they will impact the loading of uranium onto resins/polymers.

In the absence of IX, the leach solution is fed directly to a conventional solvent extraction (SX) circuit. SX is a continuous loading/stripping cycle involving the use of an organic liquid (usually a kerosene based product) to carry the extractant which removes the uranium from solution. Crud (entrained impurities in the organic) is treated usually through centrifuge filtration or bed of fine carbon.

The pregnant solution produced by the stripping cycle is then precipitated by the addition of ammonia, hydrogen peroxide, caustic soda (along with Iron removal). Peroxide products can be dried at low temperatures to produce a product containing about 80% U_3O_8. However, ammonium or sodium diuranate products must be dried at high temperatures to convert the product to 100% U_3O_8.

After recovery of the uranium, the barren solution (BLS) is re-acidified before re-injection. A small stream of oxidising agent is added before being returned to the wellfield via the injection wells to maintain redox conditions. However, a small flow (about 0.5%) is bled off to treat various dissolved ions such as chloride, sulphate, sodium, radium, arsenic and iron from the orebody and is reinjected into approved disposal wells in a depleted portion of the orebody.

Acid consumption: A general figure for Kazakh ISL production is about 40 kg acid per kgU, though other figures of up to twice that are quoted and some mines are a bit lower. Beverley in Australia in 2007 was 7.7 kg/kgU. This will be dependent on how liberated (or locked) the uranium is in the host rock and what acid consuming gangue is within the ore body.

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Investment Recommendation

Date and time of first dissemination: August 12, 2018, 22:00 ET

Date and time of production: August 12, 2018, 19:40 ET

Target Price / Valuation Methodology:

Vimy Resources Limited - VMY

Our price target is underpinned by the Mulga Rock project (NPV12%) net of corporate and other adjustments. We assume funding of the project on a 50:50 debt to equity basis.

Risks to achieving Target Price / Valuation:

Vimy Resources Limited - VMY

Risks to the investment case are posed by funding for feasibility studies and development, permitting requirements, exploration, operating commodity price and currency fluctuations.

Distribution of Ratings:

Global Stock Ratings (as of 08/12/18)

Rating	Coverage Universe		IB Clients
	#	%	%
Buy	575	62.84%	44.52%
Hold	221	24.15%	26.24%
Sell	15	1.64%	26.67%
Speculative Buy	104	11.37%	65.38%
	915*	100.0%	

*Total includes stocks that are Under Review

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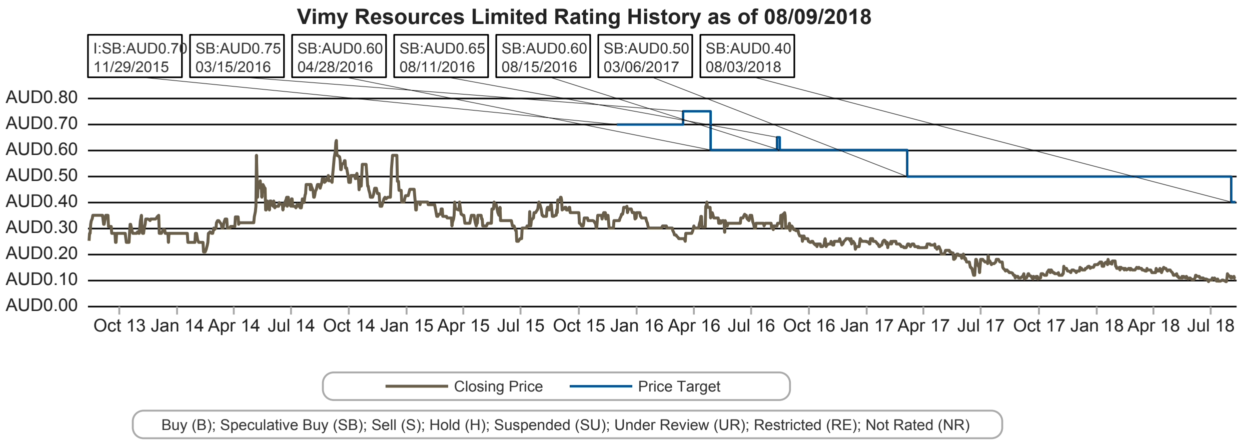

Past performance

In line with Article 44(4)(b), MiFID II Delegated Regulation, we disclose price performance for the preceding five years or the whole period for which the financial instrument has been offered or investment service provided where less than five years. Please note price history refers to actual past performance, and that past performance is not a reliable indicator of future price and/or performance.

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