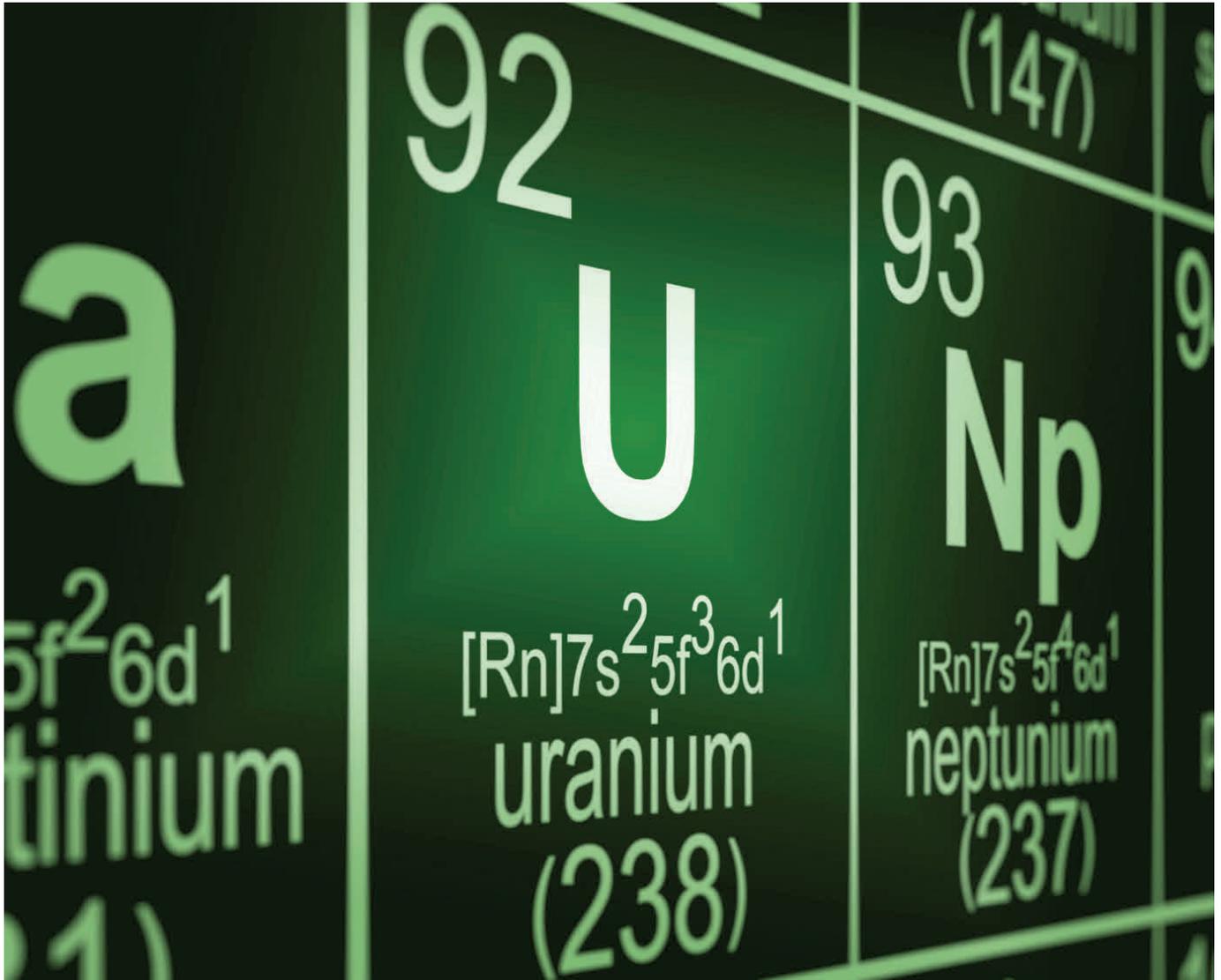




# EDISON



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## Making a case for uranium

Sector focus | Company profiles

February 2014

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# Making a case for uranium

## Life after Fukushima

**While the uranium sector is still recovering from the Fukushima-induced demand shock, the supply-demand balance is gradually improving supported by production cuts and the HEU expiration. We suggest this creates a base for the spot uranium price to recover from current lows. The potential turnaround in uranium prices should be supportive of uranium equities. As such, we suggest a strategy to play the uranium sector through high-quality exploration companies and near-term producers that offer a low opex/capex entry to the market.**

### Tightening supply-demand balance

The Fukushima disaster in Japan has had a major impact on the industry, removing some 20Mlb U<sub>3</sub>O<sub>8</sub> in consumption, or c 12% of annual global demand. Global uranium consumption has gradually recovered since then, reaching an estimated c 167Mlb U<sub>3</sub>O<sub>8</sub> in 2013 and is set to grow further on the back of expanding nuclear generating capacity in China and elsewhere. The industry has swiftly responded to the demand shock by cutting production and deferring new projects, with the announced cutbacks totalling some 20-25Mlb. In addition, the end of the HEU (highly enriched uranium) agreement will further reduce supply by 24Mlb from 2014. Overall, we estimate that the ongoing adjustment of primary and secondary supply roughly doubles the impact from the demand contraction in Japan.

### Calling the bottom of the uranium price cycle

Having reached a peak in 2007, uranium prices have undergone a downward correction followed by a modest recovery in 2011 only to resume declines on the back of the Fukushima accident. While the tightening supply-demand balance is seen as the key driver behind the uranium price, our analysis suggests that there is very little room for the spot uranium price to fall further as it appears to be close to the break-even price of the lowest cost production capacity. Another indication of the uranium sector potentially reaching the bottom of the current supply-demand and price cycle is the recent high level of M&A activity as companies take advantage of attractive market valuations. Given that global uranium demand continues to grow and the long-term supply overhang is being gradually absorbed by the market, we expect the spot uranium price to enjoy a gradual recovery from the current lows.

### Equities: 2014 offers an attractive entry point

Despite the current low level of contractual activity in the uranium market, the tightening supply-demand balance suggests that there is an upside risk to the uranium price once uranium buyers return. Given the close correlation between industrial commodities and equities, expectations of the uranium price turnaround could drive the recovery of uranium equities. In all, we see at least two equally attractive ways for investors to play the uranium sector: either to gain exposure through exploration companies with a portfolio of high-quality assets, which could be an attractive acquisition/merger target, or to focus on near-term producers that offer low capex/opex entry to the market and will either fill the regional supply gap or simply displace the high-cost capacity.

Mining

25 February 2014

#### Companies profiled in this report

Denison Mines (TSX: DML)  
Energy Fuels (TSX: EFR)  
Kivalliq Energy (TSX-V: KIV)  
Laramide Resources (TSX: LAM)  
Peninsula Energy (ASX: PEN)  
Toro Energy (ASX: TOE)  
UEX (TSX: UEX)  
Uranerz Energy (NYSE: URZ)  
Uranium Energy (NYSE: UEC)  
Ur-Energy (TSX: URE)

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## Investment summary: Making a case for uranium

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While the Fukushima accident was a major blow for the uranium sector, global uranium demand has gradually recovered since then, reaching an estimated c 167Mlb U<sub>3</sub>O<sub>8</sub> in 2013 and set to grow further on the back of expanding nuclear generating capacity. The industry has swiftly responded to the demand shock by cutting production and deferring new projects. In addition, the end of the HEU agreement will further reduce supply in 2014. Overall, we estimate that the ongoing adjustment of primary and secondary supply roughly doubles the impact from the demand contraction in Japan. Despite the current low level of contractual activity in the market, the tightening supply-demand balance suggests that there is upside risk to the uranium price once uranium buyers return to the market. Given the close correlation between commodities and equities, expectations of a uranium price turnaround could therefore drive the recovery of uranium equities.

### Demand recovery: Japan's restarts, China's growth

The Fukushima accident undoubtedly had a major impact on the uranium industry, with all 50 reactors in Japan still idle. We estimate that this could have removed some 20Mlb of U<sub>3</sub>O<sub>8</sub> equivalent in consumption, or c 12% of annual global demand. However, given its heavy reliance on nuclear energy and a high cost of substitution through LNG, Japan is preparing for partial restarts of its fleet, with 16 reactors currently in the process of licence renewal. Globally, there are 68 new reactors under construction and another 173 planned (based on WNA), with China leading the way as it continues its expansion of nuclear generation. China's nuclear generating capacity is expected to increase from 18GW (end-2013 estimate) to 58GW, with an additional 30GW under construction, by 2020. Some 13GW of capacity is expected to be added in 2013-15 and another c 30GW over 2016-20. China's long-term goal is to grow nuclear generating capacity to 200GW by 2030.

### Supply-side response and HEU expiration to remove supply overhang

The uranium industry has swiftly responded to the Fukushima-induced demand shock, cutting production and deferring new projects. Based on company announcements, we estimate that at least some 20-25Mlb of U<sub>3</sub>O<sub>8</sub> equivalent supply could be scaled back by the major producers as a result of the deteriorated market conditions. The most recent example is Paladin's Kayelekera mine, which has a capacity of 3.3Mlb and was put on care and maintenance in February 2014. The reduction in primary supply is therefore of a similar scale to the post-Fukushima demand contraction in Japan. In addition to the primary supply adjustment, the end of the HEU agreement between the US and Russia will remove as much as 24Mlb of U<sub>3</sub>O<sub>8</sub> from the secondary market in 2014 and onwards. This should further tighten the uranium supply-demand balance.

### Calling the bottom of the uranium price cycle

While the tightening supply-demand balance is the key driver behind the uranium price, our analysis suggests that there is very little, if any, room for the spot uranium price to fall further. Based on our simplified calculations (see page 17 for more details), the U<sub>3</sub>O<sub>8</sub> spot price appears to be close to the break-even price of the lowest-cost capacity within the Athabasca Basin (ie among the lowest cost globally), which represents some 16% of global production. Given that global uranium demand continues to grow and the supply overhang is being gradually absorbed by the market, we expect the spot uranium price to enjoy a gradual recovery from the local lows. Since equities' performance is often closely linked to the commodity price, we therefore believe that the risk to uranium equities is firmly on the upside.

## **M&A activity continues unabated**

While the exact timing with respect to full absorption of the supply overhang remains unclear, the current high level of M&A activity could be an indication of the uranium sector reaching the bottom of the current supply-demand and price cycle as companies take advantage of attractive market valuations. Our analysis suggests that there is a substantial premium implied by recent M&A transactions compared with current market valuations. This varies accordingly based on geography, scale and stage of the project. Our universe of uranium explorers is currently trading at an EV/resource multiple of US\$2.5/lb (US\$3.2/lb if junior and near-term producers are included). This compares to a global multiple of US\$4.8/lb (US\$7.8/lb for Canadian assets) based on recent sector M&A transactions.

## **Suggested investment strategy**

In all, we see at least two equally attractive ways for investors to play the uranium sector:

- to gain exposure through exploration-stage companies with a portfolio of high-quality assets (key selection criteria would be potential scale and depth of the resource base, grades, likely project economics, management strength, risk profile), which could be an attractive acquisition/merger target; or
- to focus on near-term producers that offer low opex/capex entry to the market and will either fill the regional supply gap (such as Uranerz or Ur-Energy in the US) or simply displace the higher-cost global or regional production capacity.

## **Still a few reasons to be cautious...**

Despite being positive on the uranium sector in the short to medium term, we believe that the sector is facing a number of risks in the long run. Firstly, Japanese utilities are believed to be sitting on a uranium inventory that could amount to as much as 40-60Mlb of U<sub>3</sub>O<sub>8</sub> equivalent. Slower than expected reactor restarts in Japan could therefore lead to a substantial material overhang. Secondly, the stricter regulatory requirements and the general uncertainty created by the Fukushima accident could slow down the global expansion of nuclear generating capacity. This could be seen in the temporary suspension of approvals for new nuclear power stations in China. Finally, we would also highlight the risk (dependent on geography) to the long-term competitiveness of nuclear fission as an energy fuel arising from the improved regional availability and lower prices of natural gas.

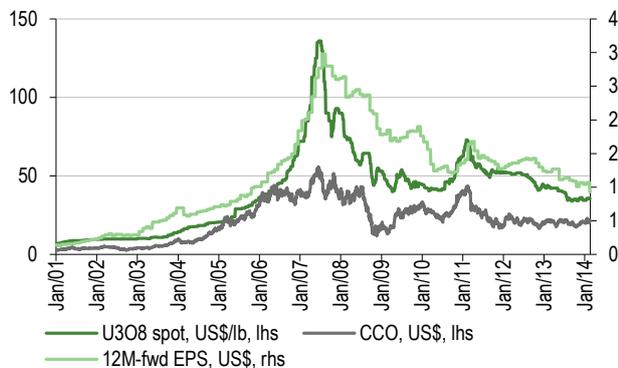
## Valuation, catalysts and uranium pricing

### Equities' performance: Trailing the uranium price

Similar to other industrial commodities, uranium equities tend to move in line with, if not ahead of, the uranium price. It is usually the case that investors take a forward-looking view on a commodity cycle that drives producers' earnings and more generally underpins the sentiment within a sector. Exploration equities also demonstrate a close relationship with the commodity price (see Exhibit 3), normally experiencing higher volatility and therefore being less defensive than cash-generative producers. It is therefore not a big surprise that the uranium equities were hit hard on the back of the sharp drop in the uranium price due to the Fukushima accident. Since February 2011, the spot uranium price has fallen 51% compared to a 70% drop in explorers' equities (based on our simple capitalisation-weighted index that consists of 11 exploration companies). At the same time, Cameco has only seen a 50% reduction in its share price.

Our cautiously positive view on the uranium price, which we believe to have bottomed out as the supply overhang is being gradually removed, suggests that uranium equities could represent an attractive investment opportunity. Looking at Cameco's (CCO:TSX) market cap of C\$9.5bn, which due to its leading industry position and broad coverage could be viewed as a good proxy for the uranium sector, we note the stock has recently been showing strong signs of re-rating (see Exhibit 2), with its 12-month-forward P/E reaching 23x (versus the 14-year average of 18x). This suggests that investors might have started to price in the potential recovery in uranium prices. While we discuss the key sector catalysts in more detail below, we note that an important psychological driver behind uranium prices is likely to be the beginning of reactor restarts in Japan in 2014.

**Exhibit 1: CCO share price, 12m-fwd EPS vs U<sub>3</sub>O<sub>8</sub> spot**



Source: Bloomberg, Edison Investment Research

**Exhibit 2: Cameco's 12m-forward P/E**



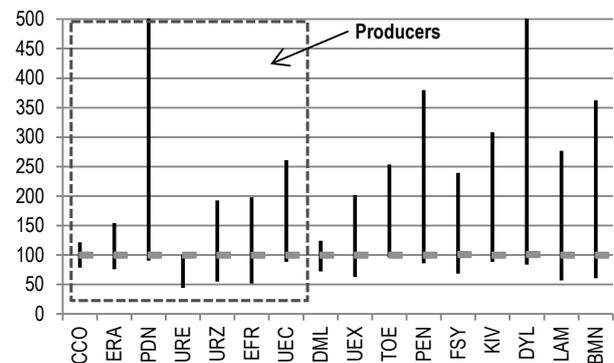
Source: Bloomberg

**Exhibit 3: Explorers' performance vs uranium price**



Source: Bloomberg, Edison Investment Research

**Exhibit 4: Share price relative to two-year max/min (%)**



Source: Bloomberg

Exhibit 5 shows our universe of uranium explorers as well as junior and near-term producers. From this, we would highlight at least two major points. Firstly, not surprisingly, near-term and junior producers that offer a relatively low capex/opex exposure to the market as well as the benefit of premium-priced long-term domestic off-take contracts (eg Ur-Energy, Uranerz and to a certain extent Uranium Energy) trade at a considerable premium on an EV/resource basis to explorers (peer group weighted average EV/resource of US\$3.2/lb compared to US\$2.5/lb if all junior and near-term producers are excluded). The price-to-book value multiple paints a similar picture, with URE, URX and UEC trading at an average P/BV of 3.3x compared to an 0.8x multiple for explorers. We note that all four junior/near-term producers in our peer group are focused on the US market, which represents an attractive import substitution opportunity (although it has the largest installed nuclear generating capacity, the US is only c 10% self-sufficient in uranium).

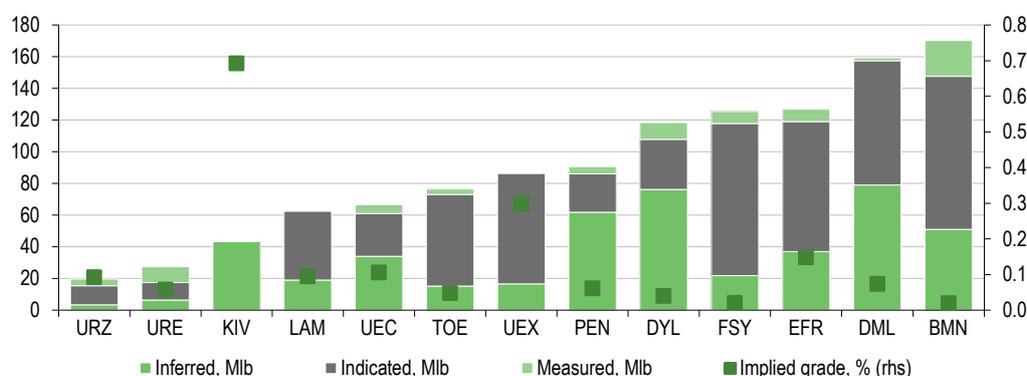
Secondly, market valuations that are currently attributed to uranium exploration companies are visibly lower than those implied by recent M&A transactions (see Exhibit 9). This is certainly subject to some regional valuation discrepancies due to differences in projects' economics and risk profiles. Finally, we note that almost all companies in our uranium universe are trading above their local troughs (see Exhibits 4 and 5), which in our view could be a reflection of improved expectations of a recovery in uranium prices as well as an M&A premium in some cases. However, the valuation range is broad as investors remain selective, with a general preference for cash-rich companies with quality assets and a clear path to production.

**Exhibit 5: Selected peer group valuation comparison**

	Assets	Status	Share price, US\$	2y-high, US\$	2y-low, US\$	Market cap, US\$m	EV, US\$m	Attributable U <sub>3</sub> O <sub>8</sub> , Mlb	Grade, %	Implied EV/resource US\$/lb	P/BV
Denison	Canada	Explorer*	1.32	1.71	1.00	625	597	159.3	0.07	3.7	2.1
Ur-Energy	US	Producer	1.42	1.46	0.66	181	205	27.3	0.06	7.5	2.9
Energy Fuels	US	Producer	9.29	18.3	4.77	182	192	126.7	0.15	1.5	1.3
Uranium Energy	US	Producer	1.66	4.28	1.45	149	142	66.6	0.11	2.1	2.5
Uranerz	US	Producer**	1.50	3.03	0.86	129	128	19.6	0.09	6.5	4.4
UEX	Canada	Explorer	0.45	0.95	0.30	102	92	86.3	0.30	1.1	0.6
Toro Energy	Australia	Explorer	0.06	0.15	0.06	90	87	76.5	0.05	1.1	0.7
Peninsula	US	Explorer	0.02	0.08	0.02	67	66	90.6	0.06	0.7	0.7
Forsys	Africa	Explorer	0.44	1.07	0.31	49	45	125.4	0.02	0.4	0.5
Laramide	Australia	Explorer	0.50	1.50	0.31	39	43	62.5	0.10	0.7	0.5
Kivalliq Energy	Canada	Explorer	0.20	0.60	0.17	38	34	43.2	0.69	0.8	0.7
Deep Yellow	Australia	Explorer	0.02	0.14	0.02	29	26	118.5	0.04	0.2	0.3
Bannerman	Africa	Explorer	0.07	0.25	0.04	22	25	170.2	0.02	0.1	0.4
<b>Weighted average</b>										<b>3.2</b>	<b>1.9</b>
<b>Weighted average excluding producers</b>										<b>2.5</b>	<b>1.5</b>

Source: Company data, Bloomberg, Edison Investment Research. Note: \*Denison has a 22.5% interest in the McClean Lake JV, which includes the uranium mill, one of the world's largest uranium processing facilities. \*\*First production is expected in Q114.

**Exhibit 6: Selected peer group resource composition and average grades**



Source: Company data, Edison Investment Research

## Key industry catalysts

We see a number of short- to medium-term catalysts that we believe could drive the recovery of the uranium sector, supporting both demand and prices. These are the growth of nuclear generating capacity in China, potential restarts of nuclear reactors in Japan, expiration of HEU as well as production cuts from the industry. All this is expected to improve the global uranium supply-demand balance, with the removal of Japan's demand being offset by the pronounced supply-side response and the HEU withdrawal.

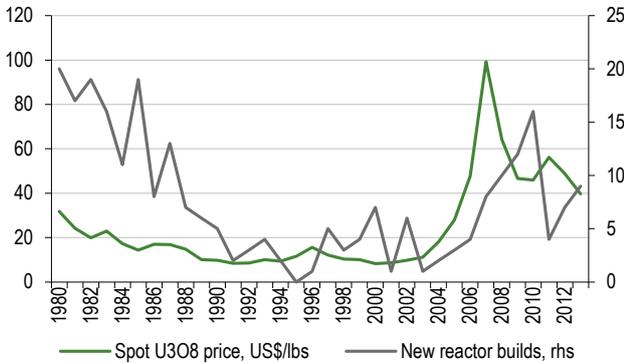
- **China's expansion in nuclear generation.** Given the inevitable fight against air pollution, China's expansion of nuclear electricity generation appears to be a natural move. With 28 reactors under construction, 38 reactors in planned status and 108 reactors under consideration, China's nuclear generating capacity is expected to grow from the current c 18GW to 58GW by 2020 and 200GW by 2030. While China has been active in acquiring foreign uranium assets, in the case of the most optimistic expansion scenario it is unlikely to achieve full self-sufficiency in uranium supplies.
- **End of the HEU agreement.** The expiration of the megatons to megawatts programme, also known as the highly enriched uranium (HEU) treaty, is an important catalyst and will have a significant impact on the secondary supply of uranium. In the past, the HEU agreement, which assumed annual sales of 24Mlb of U<sub>3</sub>O<sub>8</sub>, has supplied c 13% of world demand or c 45% of US annual uranium needs. We note, however, that there are other secondary uranium sources (such as tailings re-enrichment and US Department of Energy stocks) that could partly replace the HEU, therefore making the impact from its withdrawal less pronounced.
- **Potential restart of reactors in Japan.** All of Japan's 50 nuclear reactors are currently offline following the Fukushima accident, which we believe could have removed up to 20Mlb in annual consumption from the global uranium market. However, after new regulatory standards took effect in July 2013, seven utility companies have already applied for the restart of 16 reactors. While visibility remains very low, there are expectations that at least three to four reactors could be brought back online by the end of 2014.
- **Primary supply adjustment.** The industry has responded to weakening demand and the subsequent fall in the uranium price by reducing primary supply. Based on the recently announced project deferrals and mine shutdowns, we roughly estimate that up to 25Mlb of U<sub>3</sub>O<sub>8</sub> might be removed from the market, easing the current oversupply. We would not rule out further high-cost capacity being driven off the market if the prevailing depressed pricing environment persists.
- **High M&A activity.** We note an increased level of M&A activity in the sector, which could indicate the bottom of the price and supply-demand cycle as companies take advantage of attractive valuations.

## Uranium prices: Recovery is likely, but downside risks remain

Having reached a peak in 2007, uranium prices have undergone a downward correction followed by a modest recovery in 2011, only to resume declines on the back of the Fukushima accident. As a result, the spot price is currently trading at c US\$36/lb (51% below its 2011 peak, and just 3% above the recent trough), while the long-term contract price stands at c US\$50/lb. Interestingly, the spike in uranium prices that was seen in 2007 broadly coincided with the increase in new reactor construction starts, which at that point was primarily driven by China (see Exhibit 7). This could be explained by utility companies securing material ahead of the reactor commissioning, which in China normally takes five to six years (in Europe/US up to 10 years) to occur. Overall, given the gradually improving global uranium supply-demand balance thanks to the ongoing supply-side adjustment and continuing demand recovery, we believe that the risks to the uranium (spot) price are currently on the upside. Our view is also supported by the fact that the spot uranium price is close to the break-even price of the lowest-cost producing capacity in Athabasca Basin, which

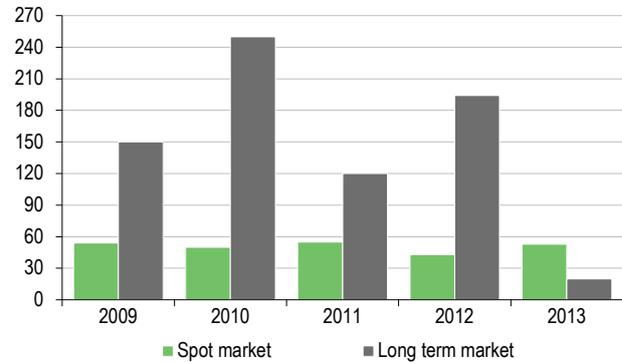
represents some 16% of the global uranium supply. Having said that, there are still a number of challenges that the industry will have to overcome, such as the uncertainty with uranium inventory at the Japanese utilities as well as the suspension of reactor approvals in China.

**Exhibit 7: Uranium price versus new reactor builds**



Source: Bloomberg, IAEA, Edison Investment Research

**Exhibit 8: Spot and long-term uranium contracts, Mlb**



Source: Cameco

Despite the recent moderate pick up in reactor construction activity (we can identify at least seven new construction starts in 2012 and another nine in 2013) and expectations of more reactor builds in China and elsewhere, the uranium price has been undermined by the removal of Japan's demand as well as the general regulatory uncertainty caused by the Fukushima accident. In this respect, we note Cameco's (the largest public uranium producer in the world) comment on the extremely low contractual activity in the sector in 2013, which might suggest that utilities are in no immediate need to replenish their inventories, simply sitting on the side-lines waiting for the price gap between the spot and long-term contract to close.

The current situation with the assumed accumulated uranium inventories at the Japanese utilities creates additional uncertainty as it means that any delays in reactor restarts in Japan may lead (if it has not already) to a substantial material overhang. Assuming that a utility company typically holds uranium inventory to cover up to two or three years of its consumption, the shutdown of 50 reactors in Japan roughly translates to up to 40-60Mlb of U<sub>3</sub>O<sub>8</sub> equivalent stockpiles that could potentially hit the market in the worst case. This represents a significant risk to any potential recovery in the uranium price, in spite of the otherwise gradually improving supply-demand balance thanks to the HEU expiration, high-cost mine shutdowns and new projects deferrals.

An additional risk to the uranium price is China's growing self-sufficiency in uranium supply. China's near-term Husab mine development and its recent acquisition of a 25% interest in Paladin's Langer Heinrich mine (both located in Namibia) suggest that despite being the major driver behind global nuclear generating capacity, China's reliance on third-party uranium supplies is likely to diminish in the medium to long term.

## M&A activity remains at elevated levels

M&A activity in the global uranium sector continues unabated, with a number of large-scale deals having been closed in 2013 and early 2014 across all major geographies. Among other things, this could be a good indication of the industry being at the bottom of the current price and supply-demand cycle. We see two major trends that have been dominating the M&A market over the last few years. These are the consolidation of the uranium sector in Canada and China acquiring foreign uranium assets in order to facilitate its expansion into nuclear generation.

In Canada, the most recent transaction was an all-share merger between Fission Uranium and Alpha Minerals, which were JV partners developing the Patterson Lake project in Athabasca Basin. While the project has no compliant resource, based on Edison's resource estimate of 100Mlb on a 100% basis, the deal implied an EV/resource multiple of US\$3.1/lb. While this is the lowest

resource-based valuation multiple within the high-quality Canadian space (average of US\$7.8/lb), it is worth noting that the Paterson Lake project is based on the emerging west side of the Athabasca Basin. In contrast, the three other comparable post-Fukushima deals (Waterbury Lake, Millennium and Roughrider), which averaged US\$9.3/lb of contained resource, concerned the high-grade assets that are located on the east side of the Basin, ie in close proximity to the operating uranium mills and with access to infrastructure. The Fission/Alpha transaction should also be considered against the current depressed uranium price environment.

Importantly, the high-quality uranium transactions in the Athabasca Basin represent a considerable premium when compared to the recently completed M&A deals in Africa, the US and Australia (see Exhibit 9). As far as China's expansion is concerned, we would highlight the recently completed acquisition of a 25% stake in Paladin's Langer Heinrich mine in Namibia for US\$190m. This transaction implies a relatively high multiple of US\$5.0/lb (on a debt-free project basis), but must be viewed in the context that this is a large, producing mine and that the deal involves an offtake at spot price and as such suggests that it may not be a good M&A indicator for exploration companies.

In general, Canadian assets attract a premium valuation due to the quality of assets (high uranium grades, potential scalability, access to infrastructure, low political risk, etc), while other regional transactions demonstrate a relatively broad range of valuations. All in all, given the prevailing depressed market valuations, we believe that selective consolidation in the uranium sector is likely to continue, with a particular focus on high-quality exploration projects and low-cost producing assets.

**Exhibit 9: Selected M&A transactions in the uranium sector**

Date	Acquirer	Target	Location of assets	Transaction value, US\$m	Attributable resource, Mlb U <sub>3</sub> O <sub>8</sub>	Grade, %	Implied multiple, US\$/lb	Comment
Q413	Fission Uranium	Alpha Minerals	Canada	155.7	50.0	2.30	3.1	In Q413, Fission completed its all-share offer for Alpha valuing the company at C\$165m. While there is no compliant resource at Patterson Lake, Edison estimate suggests c 100Mlb based on drill hole data as of August 2013.
Q113	Denison Mines	Waterbury Lake	Canada	69.0	7.8	1.33	8.8	In Q213, Denison Mines closed an all-share offer to acquire a portfolio of the uranium assets of Fission Uranium. The transaction included a 60% interest in the Waterbury Lake uranium project in the eastern Athabasca Basin. The project's J-Zone could be an extension of Rio Tinto's Roughrider.
Q112	Cameco	Millennium	Canada	150.0	18.9	4.05	8.0	In Q312, AREVA announced the sale of its 27.9% share in the Millennium uranium project (Athabasca Basin) to Cameco. The project is a proposed underground mine, with an overall compliant resource of 46.8Mlb.
Q411	Rio Tinto	Hathor Exploration	Canada	644.3	57.9	8.62	11.1	In Q112, Rio Tinto completed an all-cash offer for Hathor Exploration, valuing the company at C\$654m. Hathor's main asset was the Roughrider uranium project in the western Athabasca Basin. This is a high-grade, shallow deposit.
<b>Canadian high-grade average multiple</b>							<b>7.8</b>	
Q114	CNNC	Langer Heinrich*	Namibia	760.0	152.7	0.06	5.0	In January 2014, China National Nuclear Corporation (CNNC) acquired 25% in the Langer Heinrich mine in Namibia from Paladin. According to the offtake component of the agreement, CNNC will be able to acquire 25% of production at the spot price. Langer Heinrich is a producing mine with annual capacity of 5.2Mlb of U <sub>3</sub> O <sub>8</sub> .
Q413	Azincourt	Cameco/Vena	Latin America	2.0	35.6	0.02	0.1	In Q413, Azincourt entered into a share purchase agreement with Cameco and Vena to acquire 100% of Minergja (a private Peruvian company), which held rights and interests in the Muscani and Munani uranium projects.
Q313	Denison Mines	Rockgate Capital	Africa	26.0	45.0	0.11	0.6	In Q114, Denison completed an all-share takeover (launched in Sept. 2013) of Rockgate, acquiring 100% of the company and therefore outbidding Mega Uranium, which launched an offer for Rockgate in mid-2013. Rockgate owns the Falea uranium/silver/copper project in Mali.
Q313	Toro Energy	Mega Uranium	Australia	35.0	24.0	0.06	1.5	In Q313, Toro Energy agreed to acquire Lake Maitland in Australia from Mega Uranium in an all-share deal. As a result, Mega holds a 28% interest in Toro. Lake Maitland is located 90km SE from Toro's permitted Wiluna project.
Q213	Energy Fuels	Strathmore Minerals	North America	28.2	28.1	0.32	1.0	In May 2013, Energy Fuels announced an all-share deal to acquire Strathmore Minerals, which owns the Roca Honda and Gas Hills projects in the US. The Roca Honda project is within trucking distance to EFR's White Mesa mill.
Q113	ARMZ	Uranium One	North America	2,800	285.8	0.07	9.8	Acquisition of the remaining 49% stake in Uranium One.
Q312	Cameco	BHP (Yeelirrie)	Australia	434	139.0	0.13	3.1	In Q312, BHP agreed to sell its Yeelirrie deposit in western Australia to Cameco. We understand that the project's resource might have been overestimated by c 10% as 50Mlb of indicated resource would have to be re-categorised.
Q312	Uranium Resources	Neutron Energy	Latin America	38.1	52.0	0.15	0.7	In February 2012, Uranium Resources agreed to acquire Neutron Energy assets (the Cebolleta, Juan Tafoya and Ambrosia Lake deposits in New Mexico) in an all-share deal.
Q112	CGNP	Extract Resources	Africa	2,300	512.9	0.04	4.5	In February 2012, China Guangdong Nuclear Power (CGNP) launched a C\$9.0/share cash offer to acquire Extract Resources, which owned the Husab uranium project.
Q111	ARZM	Mkuju River	Africa	1,018	101.4	0.04	10.0	The Mkuju River deal was negotiated before Fukushima at US\$11.5/lb, but renegotiated afterwards. Mkuju River is based in Tanzania.
<b>Other average multiple (excluding Uranium One)</b>							<b>2.9</b>	
<b>Grand total average multiple</b>							<b>4.8</b>	

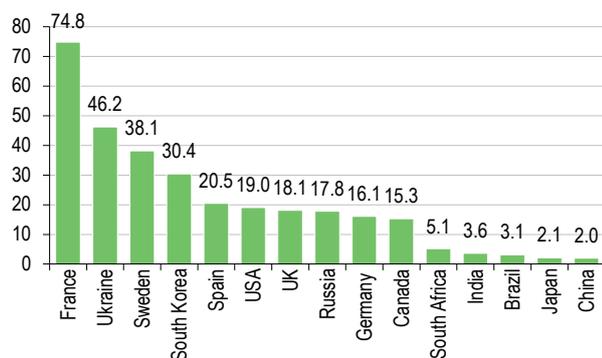
Source: Company data, Edison Investment Research. Note: \*Langer Heinrich is a producing mine and therefore this transaction is not comparable to the acquisition of exploration assets.

## Uranium supply and demand

### Demand: Still weak, but set to improve

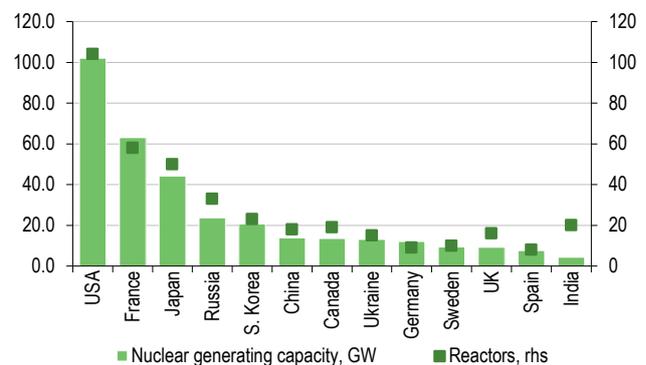
According to the International Atomic Energy Agency (IAEA), there are currently 435 operable reactors globally with overall generating capacity of 372GW (electrical). Countries with the largest share of nuclear power in the overall energy balance are France, Ukraine, Sweden and South Korea, where nuclear power accounts for more than 30% of the overall electricity generated during the year. On the other side of the spectrum is China, which currently has only 2% of its electricity generated from nuclear reactor sources. In terms of the scale of the nuclear power sector, the US has the largest number of reactors in place (104) and hence the highest installed capacity (102GW), followed by France (58 and 63GW respectively), Japan, Russia and South Korea. It is worth noting, however, that all of Japan's reactors were shut down following the Fukushima accident in April 2011. While the shutdown process was gradual, we estimate that some 20Mlb in U<sub>3</sub>O<sub>8</sub> equivalent, or c 12% of the global pre-Fukushima consumption, could have been wiped off the market as a result of the Fukushima accident. To put this into context, uranium demand peaked at 172Mlb in 2010 and, according to Cameco, has somewhat recovered since then, reaching an estimated c 167Mlb in 2013. This recovery should nevertheless be viewed cautiously, as contracting activity remains sluggish. In particular, Cameco suggested that in total only c 20Mlb of U<sub>3</sub>O<sub>8</sub> were purchased on a forward basis in 2013 versus the anticipated 75-100Mlb. The majority of the transactions in 2013 took place on the spot market (53Mlb), where prices have softened considerably relative to long-term prices (US\$35/lb vs US\$55/lb).

**Exhibit 10: Nuclear share of electricity generation (%)**



Source: IAEA

**Exhibit 11: Nuclear generating capacity by country**



Source: IAEA

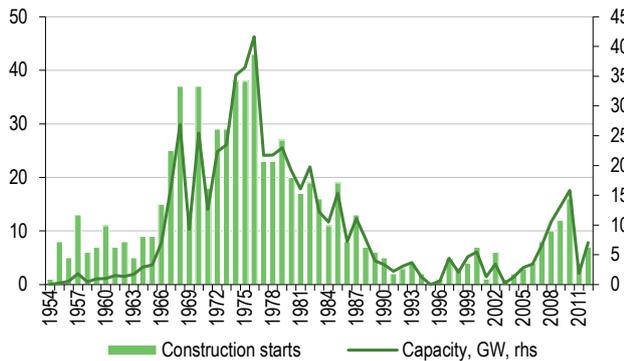
### Demand drivers: New builds and Japan's restarts

We expect uranium demand to be driven by a number of key factors, the most important being the potential restart of at least some reactors in Japan as well as the construction of new reactors in China and elsewhere in the world. The World Nuclear Association (WNA) expects global nuclear generation to grow from the current 334GW to c 574GW by 2030, representing a CAGR of 3.4%. Assuming consumption of c 150 tonnes of uranium per GW, this would suggest uranium demand almost doubling to c 224Mlb of U<sub>3</sub>O<sub>8</sub> equivalent. Cameco broadly paints a similarly optimistic picture, expecting overall uranium consumption to grow to 220Mlb U<sub>3</sub>O<sub>8</sub> by 2028 based on the anticipated 132 new reactors and 43 shut downs. It estimates 70 new reactors under construction as of 2013.

Our analysis based on the country-specific data provided by IAEA suggests that the number of new reactors under construction currently stands at 68, with 28 reactors being built in China, 11 in Russia and seven in India. On top of this, there are a large number of reactors that are either planned or proposed for construction. However these numbers differ considerably depending on the

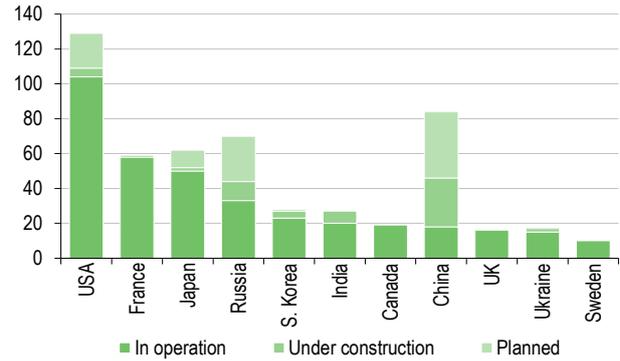
source. According to the IAEA, for example, there are 102 reactors globally that are planned for construction, whereas the WNA estimates planned reactors at 173 and has deemed another 310 reactors in the proposed category. Regardless of the source of information, it is clear that the pipeline of future nuclear power projects is healthy. This could be explained by the low CO<sub>2</sub> emissions and reliability of nuclear energy as a source of baseload electricity. Despite some of the new capacity being a replacement of an ageing fleet (this is especially acute in the US, Europe and Russia), growing nuclear generation in the emerging markets, such as China and India, will drive global uranium consumption higher in the long run.

**Exhibit 12: New reactors construction starts**



Source: IAEA

**Exhibit 13: Reactors under construction and planned**



Source: IAEA

### Japan: Nuclear reactor restarts are vital

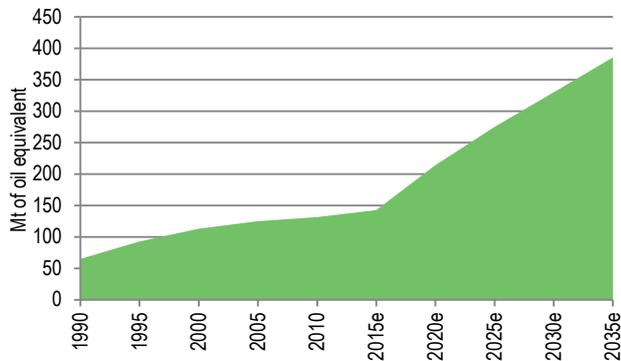
An important, short- to medium-term driver behind uranium demand lies in the potential reactor restarts in Japan. Following the Fukushima accident in 2011, all 50 nuclear reactors in Japan were gradually shut down. At present, there are seven utilities representing 16 reactors that have applied for restart under new regulatory guidelines. While visibility remains low on the timing of the potential restarts, given Japan's heavy reliance on nuclear energy, at least a partial restart of the idled capacity seems to be almost inevitable. Prior to Fukushima, some 30% of Japan's electricity needs were met from nuclear power plants. This share was planned to grow to c 40% by 2017. According to the WNA, the estimated increase in fuel imports (the nuclear gap is filled by LNG) is costing Japan some US\$40bn per annum, with the power companies having already spent an additional US\$93bn on the imported fuel since Fukushima to April 2013. As a result, the cost of generating electricity in Japan has gone up by 56% to JPY13.5/kWh (c\$13.2kWh at current exchange rate). At the same time, carbon dioxide emissions from the electricity sector have increased by 39% in 2012 compared to the pre-Fukushima period. While the restart of a reactor is a protracted (and expensive) process that could take at least six months in light of new stricter regulations, based on high case industry estimates, up to 10 reactors could be brought online every year to a total of up to 35 reactors within the next five years.

### China: 28 reactors under construction, 177 in the pipeline

China's growing expansion in nuclear generation is twofold. Not only does it aim to meet growing electricity demand, but it also needs to reduce the country's chronic air pollution. According to official estimates, it is expected that China will reduce its carbon emissions by 40-45% by 2020 from 2005 levels thanks to investments in renewables, nuclear generation and clean coal technology. Although China had temporarily suspended approvals for new nuclear power stations following the Fukushima accident (inland power plants that are facing scrutiny due to the risk of river pollution), a new safety plan has been approved and there are currently 28 new reactors under construction, with an additional four reactors to begin construction. In addition, China has 59 reactors in the planning stage and 118 in the proposed stage.

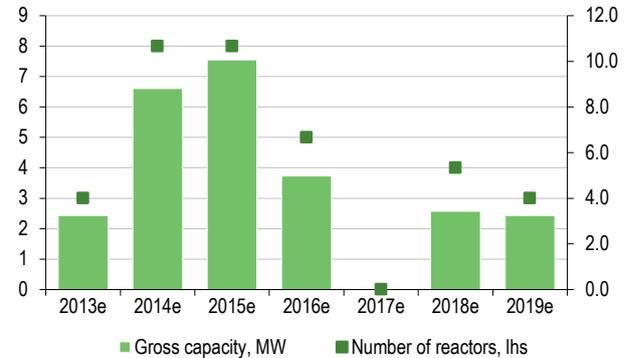
The WNA expects China's nuclear generating capacity to increase from 18GW to 58GW, with an additional 30GW under construction, by 2020. Some 13GW of nuclear capacity is expected to be added in 2013-15 and another c 30GW over 2016-20. China's long-term goal is to grow nuclear generating capacity to 200GW by 2030 and then potentially to 400GW by 2050.

**Exhibit 14: Asia-Pac total nuclear energy consumption**



Source: BP Energy Outlook

**Exhibit 15: China's near-term nuclear capacity roll-out**



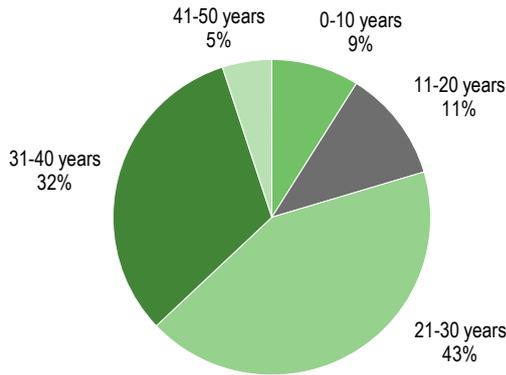
Source: Edison Investment Research, IAEA. Note: Estimates are based on the projected first grid connection.

An important feature of China's nuclear expansion is its high reliance on external sources of uranium supplies. While recent M&A activity suggests that China is looking to secure future supply and increase self-sufficiency in uranium, its reliance on external sources of supply will remain, especially in case of a rapid growth. China's commitment to its nuclear power generation expansion is clearly evident by the recent acquisitions of uranium assets in Africa. In 2014, China National Nuclear Corporation (CNNC) agreed to buy 25% of Paladin's Langer Heinrich mine, while in 2012 China Guangdong Nuclear Power (CGNC) acquired the Husab mine, both located in Namibia. Assuming full production capacity at Husab and China's 25% participation in Langer Heinrich (25% offtake at spot price), these two assets should be enough to meet China's uranium requirement at 58GW capacity. However, potential expansion to 200GW would imply incremental uranium consumption of c 55Mlb of U<sub>3</sub>O<sub>8</sub> per annum (excluding the initial cores), or c 32% of the current global consumption. We therefore believe that China is likely to maintain its high M&A activity in the sector, aiming at securing future supply.

### Uranium's competitiveness as an energy fuel

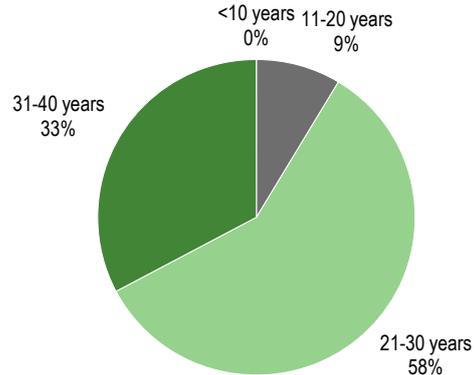
Uranium's competitiveness against natural gas and coal as an energy fuel is an important factor defining the future of uranium demand and long-term prices. The global reactor fleet is ageing and, despite likely life extensions in many cases, a growing number of decisions will have to be made in the next 10-15 years regarding the potential replacement of the existing operations. According to the data from the IAEA, some 32% of the global uranium reactor fleet is approaching the end of a minimum service life of 40 years, suggesting that potential extension decisions will have to be made where appropriate within the next 10 years. Another 43% of the reactors have been operational for 21-30 years, with life extension decisions to be made within the next 10-20 years. The existing situation in France, the second largest country by nuclear generating capacity, deserves particular mention, as 24 of its reactors (41% of total) have less than 10 years left to their minimum service life of 40 years. Importantly, in mid-2013, the French Nuclear Safety Authority issued a warning suggesting that the potential life extensions (for the initial 10 years) should not be taken for granted and that policy decisions should be made to avoid the potential negative impact on the energy supply. On the other hand, we note the US experience, where the majority of life extension requests were satisfied by the regulator. In particular, as of December 2012, the US Nuclear Regulatory Commission (NRC) granted licence renewals to 72 of the 102 operating US reactors, extending their operational life by 20 years to 60 years overall.

**Exhibit 16: Global nuclear reactor fleet by age**



Source: IAEA

**Exhibit 17: France's reactors breakdown by age**

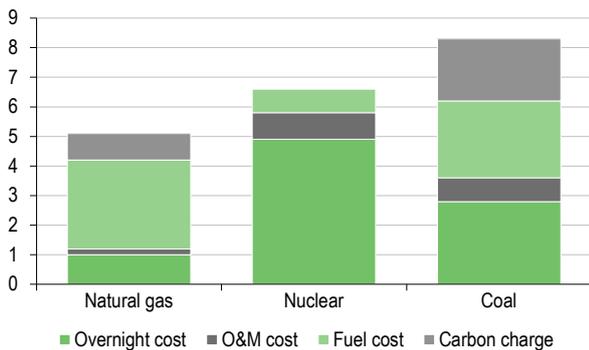


Source: IAEA

### A closer look at the levelised cost of electricity

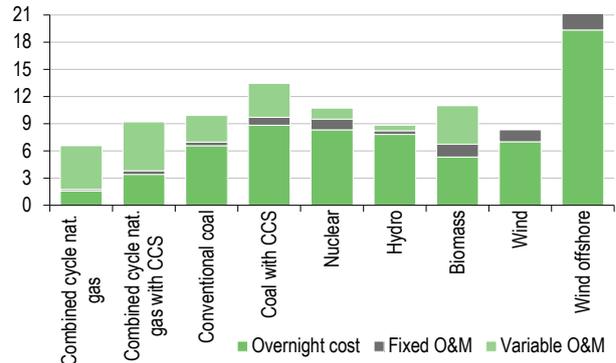
In general, it seems that the likelihood of the first round of life extensions (ie beyond the initial 40 years) for the majority of reactors is high. However, the growing age of the reactor fleet (especially in developed countries), with its higher operation and maintenance (O&M) costs and capex to meet the regulatory requirements, should be considered against the backdrop of the structurally lower natural gas and coal prices as well as the improved regional availability of these commodities. A useful criterion when comparing economics of different energy projects is the levelised cost of electricity (LCOE), which is a minimum price at which electricity must be sold in order for the project to have a present value of zero. The LCOE is highly sensitive to assumptions such as discount rate, fuel costs and investment incentives, and should therefore be compared only within a certain region. Exhibit 18 (LCOEs calculated by MIT, based on a real discount rate of 7.8% and a carbon charge of US\$25/t CO<sub>2</sub>) and Exhibit 19 (LCOE calculated by the EIA, using a real WACC of 6.6%, plus 3pp for greenhouse gas intensive technologies) show the LCOE breakdown by type of energy generation in the US. While nuclear power appears to be a competitive source of energy, especially relative to coal (conventional as well as with carbon capture), the attractiveness of natural gas in the US (the country with the largest number of reactors and installed nuclear capacity) is immediately apparent.

**Exhibit 18: US LCOE breakdown – MIT (c/kWh)**



Source: MIT. Note: Based on gas price of US\$4/mmBtu.

**Exhibit 19: US LCOE breakdown – EIA (c/kWh)**

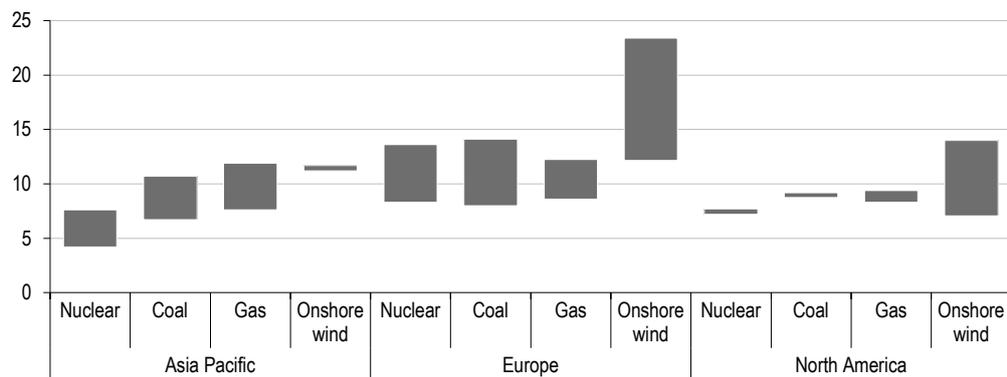


Source: US Energy Information Association (EIA)

At the same time, the geographical comparison from the IEA (based on data collected in 2009 from 190 projects in 21 countries, using a real discount rate of 10% and carbon charge of US\$30/t CO<sub>2</sub>) paints a somewhat different picture, with nuclear generation being competitive in almost every region. Asia-Pacific represents a particularly interesting case to us as the region has no benefit of cheap and abundant natural gas supplies, which coupled with a relatively high cost of coal-fired generation with a carbon capture technology, makes uranium an attractive proposition as an energy

fuel. We also note that Asia-Pacific has relatively low capital intensity for nuclear generating capacity, which significantly enhances the economics of its nuclear power projects. For instance, the Chinese CPR-1000 reactors, which are based on French PWR technology imported in the 1990s, cost c US\$1,800/kW to build, compared to the PWR's overnight cost of c US\$4,000-6,000/kW in OECD countries. This bodes well for China as it undergoes a major expansion in nuclear generation. In general, the overnight (capital) cost is the biggest component of LCOE for a uranium generating project, while fuel only represents a small portion of the levelised cost. This is in contrast to natural gas, which normally has a relatively low capex but high variable operations and maintenance cost (a substantial part of it is fuel). This suggests that nuclear power generation could easily absorb the higher uranium price but could be sensitive to the higher cost of capital, while the economics of gas-fired power generation is highly dependent upon changes in natural gas prices.

**Exhibit 20: Regional LCOE comparison – maximum and minimum costs, c/kWh**



Source: International Energy Agency (IEA)

**Exhibit 21: Qualitative assessment of generating technology risks**

	Unit size	Lead time	Capital intensity	Opex	Fuel cost	CO <sub>2</sub> emissions	Regulatory risk
Gas	Medium	Short	Low	Low	High	Medium	Low
Coal	Large	Long	High	Low	Medium	High	High
Nuclear	Very large	Long	High	Medium	Low	Nil	High
Hydro	Very large	Long	Very high	Very low	Nil	Nil	High
Wind	Small	Short	High	Medium	Nil	Nil	Medium

Source: IEA

### Future of modular reactors

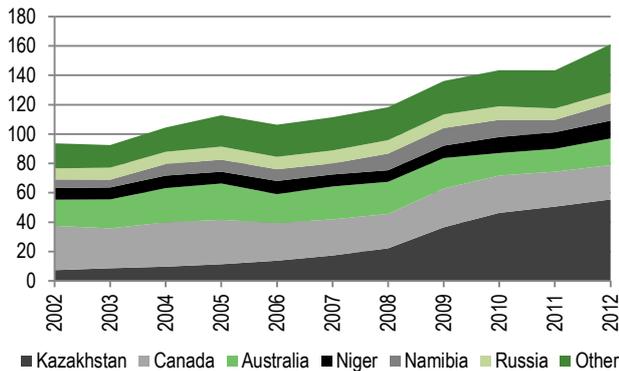
While high capital intensity and long construction time (up to 10 years from the decision point) are the key risks undermining uranium competitiveness, the potential introduction of small modular reactor (SMR) technology could reinforce the attractiveness of uranium. Initial estimates suggest that SMRs can be smaller than 300MW in capacity (compared to 1,000MW or larger for traditional reactors), built in modular arrangements and pre-fabricated at the plant to be installed at the site. In addition, the construction time is estimated to be about three years. As such, SMRs could provide utilities with the flexibility that the existing reactors lack. That said, SMRs are yet to be licensed.

### Supply-side: Improving supply-demand balance

Uranium supply is dominated by primary (mine) production and secondary (HEU, government stock sales, etc) sources. Mine supply currently accounts for c 85% of the global uranium requirement, with the remainder coming from the secondary market. Historically, the supply gaps have been filled by secondary sources. On the primary side, approximately 63% of the world's production comes from three countries, namely Kazakhstan, Canada and Australia. Kazakhstan has been gradually emerging as the dominant producer of uranium, with output rising from 7Mlb in 2002 to an impressive 55Mlb in 2012. On the other hand, Canada has been gradually losing its global market

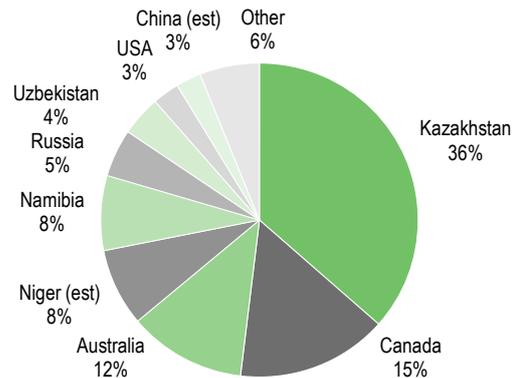
share, and only accounted for 15% of global production in 2012 compared to 32% in 2002. The main production runners up are Namibia (which almost doubled uranium output in 10 years) and Niger (a 52% growth from 2002). It is worth noting that despite a visible increase in uranium output (from 2Mlb in 2002 to 4Mlb in 2012), China remains a marginal producer with a global market share of only 3%. While China has recently been active in acquiring foreign uranium assets to increase self-sufficiency, its reliance on external supplies should remain as the country experiences a dramatic increase in nuclear power generating capacity.

**Exhibit 22: World primary uranium production, Mlb**



Source: WNA

**Exhibit 23: World uranium production by country, 2012**



Source: WNA

### Structurally oversupplied market, but the short-term balance is improving

The uranium market is currently in oversupply due to the combination of strong mine production, availability of material from secondary sources as well as demand deterioration in light of the reactor shutdowns in Japan. Taking into account the overall nuclear reactor fleet in Japan, we estimate that the Fukushima accident could have removed up to 20Mlb per annum of uranium consumption (U<sub>3</sub>O<sub>8</sub> equivalent). This is c 12% of global annual demand, which in 2013 came in at 167Mlb of U<sub>3</sub>O<sub>8</sub>. This is not to mention the existing uranium inventory that is held by utilities, which normally covers two to three years of production. Depending on the success of the restarts in Japan, this material could potentially be sold on the market, which would represent a substantial overhang risk. Having said that, we see a number of positive developments that suggest the short-term supply-demand balance is likely to improve.

- Firstly, there is the expiration of the HEU agreement signed between the US and Russia, according to which the material from nuclear warheads was down blended and sold on the market at a rate of 24Mlb U<sub>3</sub>O<sub>8</sub> per annum. This represents c 15% of global uranium consumption, some 50% of Japan's annual consumption and exceeds the annual production from McArthur River, which is the largest uranium mine, owned by Cameco. While we understand that the HEU could be replaced by other secondary sources, we believe this will happen on a 100% basis and the overall market will benefit from its withdrawal.
- Secondly, we continue to see deferrals and production cuts at primary supply projects. Based on public information, we estimate that up to 20-25Mlb of U<sub>3</sub>O<sub>8</sub> material has recently been removed from the market due to the announced mine shutdowns. The most recent example is Paladin's Kayelekera mine, which has a capacity of 3.3Mlb and was put on care and maintenance in February 2014. Another example is Energy Fuels, which is guiding a production cut back of almost 60% in 2014 from 1.2Mlb U<sub>3</sub>O<sub>8</sub> produced from its own sources in 2013. On top of this, a number of large-scale projects, such as the Kintyre project developed by Cameco and Mitsubishi as well as AREVA's Imouraren project, have been deferred (see Exhibit 24 for more details).
- Finally, Uranium Participation Corp, which is a Canadian-listed investment vehicle buying uranium (both in the form of U<sub>3</sub>O<sub>8</sub> and UF<sub>6</sub>) on the spot market, acts as a market consolidator

removing excessive supply. The company has an NAV of C\$547m at fair value (representing U<sub>3</sub>O<sub>8</sub> and UF<sub>6</sub> in a proportion of 57%/43% based on value) and holds 7.8Mlb of U<sub>3</sub>O<sub>8</sub> (and another 2.2m kgU of UF<sub>6</sub>). The company's concentrate holdings roughly account for 5% of global annual consumption. It has recently raised C\$50m gross, which at the current spot price would translate into c 1Mlb of U<sub>3</sub>O<sub>8</sub> (after expenses and assuming that 80% is invested in U<sub>3</sub>O<sub>8</sub>).

The overall impact from the mine shutdowns and project deferral is broadly similar to the withdrawal of the HEU programme, which both taken together would roughly almost double the impact from the removal of Japan's demand. This certainly does not take into account the potential uranium stock elimination at the Japanese utilities and the anticipated roll-out of relatively low-cost production capacity such as Cigar Lake. The latter, as well as China's growing self-sufficiency in uranium, suggests that more high-cost capacity could be pushed out of the market in the short term.

#### Exhibit 24: Uranium project deferrals and cancellations

Project	Company	Location	Stage	Status	Capacity (Mlb U <sub>3</sub> O <sub>8</sub> )	Comment
Honeymoon Bay	Uranium One (ARMZ)	Australia	Production	Care and maintenance	0.9	Difficulties with the production process and attaining design capacity combined with high operating costs. Carrying value of asset written down by US\$68m.
Willow Creek	Uranium One	US	Production	Scaled back	1.3	Current capacity is 1.3Mlb/year. FY14e production of 0.6Mlb at average cost of US\$28/lb. P&P reserves of 7.2Mlb of U <sub>3</sub> O <sub>8</sub> .
Mkuju River	Uranium One	Tanzania	DFS pending	Permitting	N/A	Awaiting final approval from Tanzania Ministry of Energy and Mines. Total resources of 152Mlb of U <sub>3</sub> O <sub>8</sub> with average grade c 288ppm.
Kintyre Canyon	Cameco/Mitsubishi Energy Fuels	Australia	PFS completed	Under review	6.0	Capacity based on PFS, which also stated the project requires an average realised price of US\$67/lb of U <sub>3</sub> O <sub>8</sub> .
Pinenut Mines	Energy Fuels	US	Fully permitted	Deferred	N/A	On standby since late 2013 due to low U <sub>3</sub> O <sub>8</sub> prices. Total resources of 1.6Mlb U <sub>3</sub> O <sub>8</sub> with average grade of 1.0% of U <sub>3</sub> O <sub>8</sub> . Ore to be processed through the White Mesa Mill with annual capacity of 8Mlb.
Palangana	Uranium Energy Corp	US	Production	Deferred	0.2	Placed on standby due to weak market conditions. Total resource of 1Mlb grading 0.54% U <sub>3</sub> O <sub>8</sub> . Ore to be processed through the White Mesa Mill.
Kayelekera	Paladin	Malawi	Production	Deferred	3.3	Slowing pace of mining operations, continuing permitting of production areas 4 and 5. From Nov 2010 to April 2013 0.5Mlb produced from three production areas (PA-1, PA-2, PA-3). Palangana recovered 183,000lb of U <sub>3</sub> O <sub>8</sub> during FY13.
Olympic Dam	BHP Billiton	Australia	Production	Care and maintenance	9.9	The project was placed on care and maintenance in Q114. Production of 2.9Mlb U <sub>3</sub> O <sub>8</sub> during CY13, C1 costs of US\$39.2/lb.
Imouraren	AREVA	Niger	Production	Deferred expansion	13.0	Proposed expansion to an additional 32Mlb pa for an estimated capex of C\$30bn has been postponed.
Somair	AREVA	Niger	Production	Delayed	7.8	Production delayed to early 2016.
Cominak	AREVA	Niger	Production	Temp. shut down	5.2	Project was licensed until Dec 2013, shut down for maintenance pending negotiation of licence renewal.
Trekkopje	AREVA	Namibia	Production	Temp. shut down	5.2	Project was licensed until Dec 2013, shut down for maintenance pending negotiation of licence renewal.
Sotkamo	Talvivaara	Finland	Development	Care and maintenance	8.3	Project placed on extended care and maintenance since Oct 2012.
Yeelirrie	Cameco	Australia	Development	Corporate restructuring	0.9	Cameco has recognised a US\$70m impairment charge on the Sotkamo mine. This represents Cameco's full investment for the construction of the uranium circuit. Uranium mining licence has been revoked while reorganisation of company continues.
Yeelirrie	Cameco	Australia	PFS	Under review	N/A	The project is under review due to the weak market conditions.

Source: Company data, Edison Investment Research

Despite a growing number of shut downs and deferrals, there are several large-scale projects that are expected to start production in 2013-14. In December 2013, Cameco commissioned Cigar Lake, one of the world's richest uranium mines with grades 100 times the average, which is expected to start production in Q114 (subject to availability of the processing plant from AREVA). The mine is estimated to have a capacity of 18Mlb U<sub>3</sub>O<sub>8</sub> per annum and expected to start production at 1.8Mlb per annum in 2014, gradually ramping up to full capacity by 2018. Having said that, we note that in its FY13 results announcement Cameco mentioned that it expects FY14 production to be broadly flat at 23.8-24.3Mlb (23.6Mlb in FY13), which suggests that either Cigar Lake's rollout will be slow, or it is going to be a replacement of other capacity. In addition, the Husab project in Namibia, which is 90% owned by China Guangdong Nuclear Power, is expected to be

launched in 2015, reaching full capacity of 15Mlb by the end of 2017. This project is expected to support China's expansion in nuclear power generation. While these are the key greenfield projects that are about to start production, there are a number of smaller-scale regional projects, such as Vitimsky in Russia and Novokonstantinovskoe in Ukraine, that could be brought into production to supply the local markets (to increase self-sufficiency in Ukraine and facilitate growth in Russia). In this respect, we note that the WNA estimates suggest that uranium supply is likely to continue to exceed demand until 2017, at which point the growth in consumption could remove the oversupply.

## Incentive prices: A hypothetical uranium project

In this section we look at the economics of a hypothetical uranium project based within the Athabasca Basin of northern Saskatchewan, Canada, representing one of the most significant uranium metallogenic districts in the world. The province of Saskatchewan has a long stable history of uranium mining and is consistently rated in the top five mining jurisdictions in the world by the Fraser Institute. The purpose of this exercise is to understand both the incentive and marginal price of uranium that would determine a) a theoretical break-even price at the NPV level for the case of a potential new supply and b) a break-even price at the EBITDA level for the currently producing capacity. For this, we differentiate between five distinctive scenarios: open-pit (OP) and underground (UG) operations within the east side and west side of the uranium-rich Athabasca Basin. We have also considered an open-pit operation on the east side of the Basin, with ore toll treated at a third-party mill nearby. The east side is where the current producing capacity is concentrated, while the west side is represented by promising new discoveries. One of the obvious differences between these two locations is the availability of surface infrastructure as well as the spare processing capacity on the east side. Clearly, this affects both capex and opex of any potential uranium project on the west side of the basin. This is especially so for the capital intensive underground projects.

### Our analysis is based on the following assumptions:

- We assume that our hypothetical uranium deposit contains a mineable resource of 100Mlb of  $U_3O_8$ , head grade of 1.5%, concentrate recovery of 98% and an annual processing rate of 150kt of ore. This translates into production of 4.9Mlb of  $U_3O_8$  per annum.
- We estimate the pre-production capital cost for all four types of operation separately based on the surface and underground (including shafts) infrastructure, processing and tailings management. Our capex estimates range from US\$325m, or US\$67/lb, in the case of the open-pit operation on the east side with third-party processing, to US\$1,725m, US\$355/lb, for the west-side underground. We assume that capex is sunk in a 10%/50%/30%/10% proportion over the first four years of the project's life, with production commencing in year four.
- On the opex side, we use the C1 cash cost (mining, processing, direct G&A and materials such as fuel) adjusted for royalties (US\$7/lb). Our opex estimates range from US\$27/lb at the east-side open-pit operation to US\$44/lb at the west-side underground. In general, processing accounts for the biggest share of costs, followed by G&A and materials as well as mining. As for the toll treatment, we assumed a 30% mark-up in processing cost over the base case scenario of US\$11/lb.
- We use a 10% discount rate to arrive at the NPV break-even price. We therefore do not account for any required return on capital, which would further increase our incentive price estimate. For instance, if we assume an arbitrary 15% required IRR, the uranium incentive price would rise to US\$55/lb open-pit and US\$99/lb underground for the east side, US\$45/lb for the OP east side with toll treatment, and US\$70/lb open-pit and US\$121/lb underground for the west side.

- Finally, our capital cost estimates do not take into account any earlier stage exploration expense, which for a large-scale mining project could amount to tens of millions of dollars. This would further increase incentive prices.

**Exhibit 25: Inventive and break-even prices for a uranium project in the Athabasca Basin**

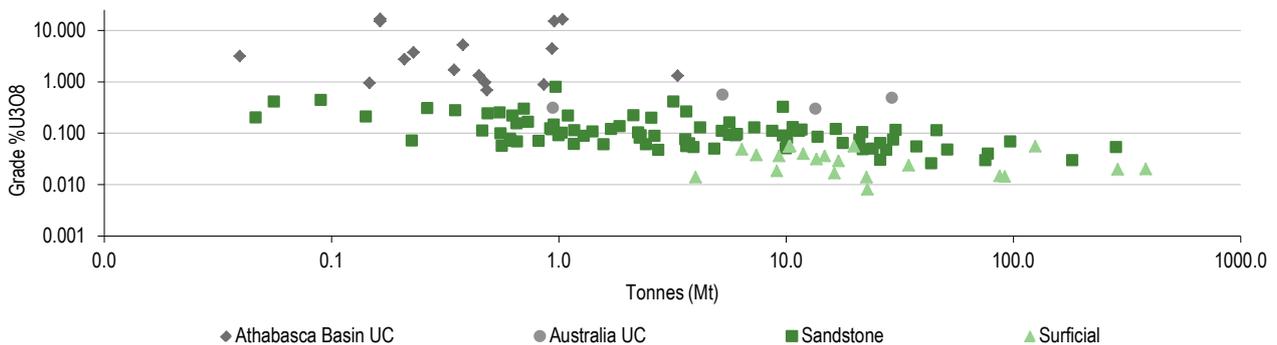
		East side			West side	
		Underground	Open pit	Open pit with toll treatment*	Underground	Open pit
Spot U <sub>3</sub> O <sub>8</sub> price	US\$/lb	36	36	36	36	36
LT U <sub>3</sub> O <sub>8</sub> price	US\$/lb	50	50	50	50	50
Resource, contained U <sub>3</sub> O <sub>8</sub>	Mlb	100	100	100	100	100
Feed grade	%	1.5	1.5	1.5	1.5	1.5
Annual (U <sub>3</sub> O <sub>8</sub> ) production	Mlb	4.9	4.9	4.9	4.9	4.9
<b>Pre-production CAPEX</b>	<b>US\$m</b>	<b>1,525</b>	<b>625</b>	<b>325</b>	<b>1,725</b>	<b>625</b>
<b>Capital intensity</b>	<b>US\$/lb</b>	<b>314</b>	<b>129</b>	<b>67</b>	<b>355</b>	<b>129</b>
Revenue (at LT price)	US\$m	243	243	243	243	243
Cash cost (C1 plus royalty)	US\$/lb	30.3	27.0	30.2	43.8	41.5
Implied cash margin (at LT price)	US\$m	96.0	111.8	49.9	30.4	41.3
Unit cash margin	US\$/lb	19.8	23.0	10.3	6.3	8.5
<b>NPV break-even price (at 10% discount rate)</b>	<b>US\$/lb</b>	<b>78.4</b>	<b>46.7</b>	<b>40.4</b>	<b>98.3</b>	<b>61.0</b>
U <sub>3</sub> O <sub>8</sub> price to achieve 15% required IRR	US\$/lb	99.0	55.0	45.0	120.8	69.5
<b>EBITDA break-even price</b>	<b>US\$/lb</b>	<b>30.3</b>	<b>27.0</b>	<b>30.2</b>	<b>43.7</b>	<b>41.5</b>

Source: Industry sources, Edison Investment Research. Note: \* Assuming that ore is toll treated at a third-party mill.

In all, our simplified analysis suggests that the NPV break-even uranium price for projects on the west side of the basin is US\$61/lb of U<sub>3</sub>O<sub>8</sub> for open-pit and US\$98/lb for underground. For the east side, the uranium prices are US\$47/lb for open pit and US\$78/lbs for underground. The EBITDA (C1 cash margin) break-even price is US\$27/lb for open pit and US\$30/lb for underground on the east side, and US\$42/lb for open pit and US\$44/lb for underground on the west side. The third party processing option could somewhat reduce the project's NPV break-even price, which falls to US\$40/lb, while increasing the EBITDA break-even price slightly (to US\$30/lb). This compares to the current spot uranium price of c US\$35/lb and the contract price of c US\$50/lb. Given that the Canadian capacity is one of the lowest in cost globally, it is likely that the uranium price has bottomed out, and while there is potential for contract prices to catch up on the downside with the spot price, the spot price should find support at current price levels.

## Uranium geology

Given that the average crustal abundance of uranium is c 2-3ppm, it is not surprising that there are numerous deposit types. According to the U.S. Geological Survey, there are 14 distinct types of uranium deposits. However, in terms of the most common and most economically important we have narrowed the list down to three main types: 1) unconformity related, 2) sandstone hosted and 3) surficial types (or calcrete type deposits). There are, however, some notable exceptions. The Olympic Dam mine in Australia, for example, is by far the world's largest uranium deposit in terms of resources, containing over 1bn tonnes grading at 0.06% U<sub>3</sub>O<sub>8</sub>. It is a by-product within an iron-oxide-copper-gold deposit. Another example is the prolific Rossing uranium mine in Namibia, where the uranium is hosted within deformed intrusive rocks (alaskite). Other large tonnage low-grade uranium deposits include the black shale hosted deposits. While there are important differences between uranium deposits, they all rely on the geochemical characteristics of uranium, that is in its hexavalent form (+VI valence) uranium is soluble and thus is easily transportable and must be reduced to its tetravalent state (+IV valence) to form commercially viable concentrations of uranium.

**Exhibit 26: Grade versus tonnage for selected uranium deposit types**


Source: Edison Investment Research

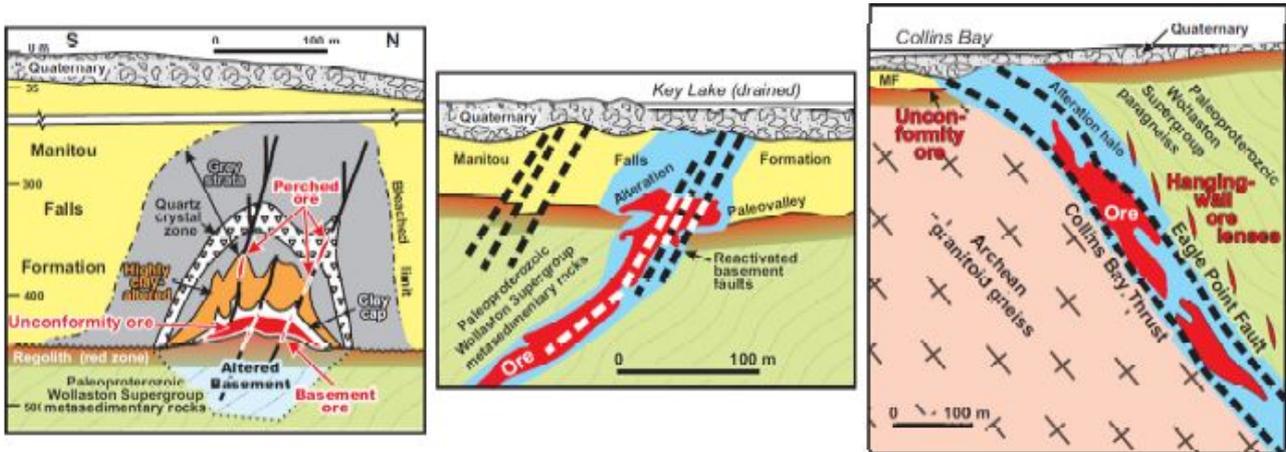
### Characteristics of unconformity type deposits

Unconformity related uranium deposits represent the highest grade (0.3-16%  $U_3O_8$ ) of all deposit types and account for c 20% of the global primary production from mostly Canada and Australia. These deposit types are associated with and occur immediately below and above the geological contact that separates older crystalline basement rocks from the overlying younger sedimentary rocks.

An unconformity contact is a buried erosion surface that separates two rock masses or strata of different ages, indicating a hiatus in the sedimentological record. The basement crystalline rocks usually exhibit intensive alteration to varying depths due to the paleoweathering profile (regolith). Precipitation of uranium, usually uraninite in the form of pitchblende, generally occurs at or near the unconformity that separates the overlying oxidised sandstones from the underlying reduced basement rocks comprised of graphite bearing metasedimentary or intrusive rocks. Below the unconformity, basement rocks are often faulted and brecciated. Faults and other structures provide important pathways for uranium-bearing oxidised fluids, which then precipitate when encountering a reductant such as the graphite-bearing basement rocks. Over the course of geological history these deposits are remobilised and enriched through multiple mineralisation events. While there are numerous Paleoproterozoic basins (1.6-2.5Ga) located throughout the world, the Athabasca Basin located in northern Saskatchewan and Alberta, Canada, is unique in that it has defined some of the highest-grade unconformity type deposits discovered.

Unconformity type deposits are also categorised as monometallic, where uraninite is the main mineral, or polymetallic deposits, where variable amounts of Ni, As, Co, Pb and trace amounts of Au, Pt and Cu occur. However, significant contents of Au have been known to occur in monometallic deposits. Although there are numerous differences among unconformity deposits that warrant further sub-types the main characteristics are intense alteration and fracture controlled mineralisation. Examples of various alteration halos are shown from unconformity type deposits within the Athabasca Basin.

**Exhibit 27: Alteration characteristics of unconformity type deposits with examples from the Athabasca Basin**



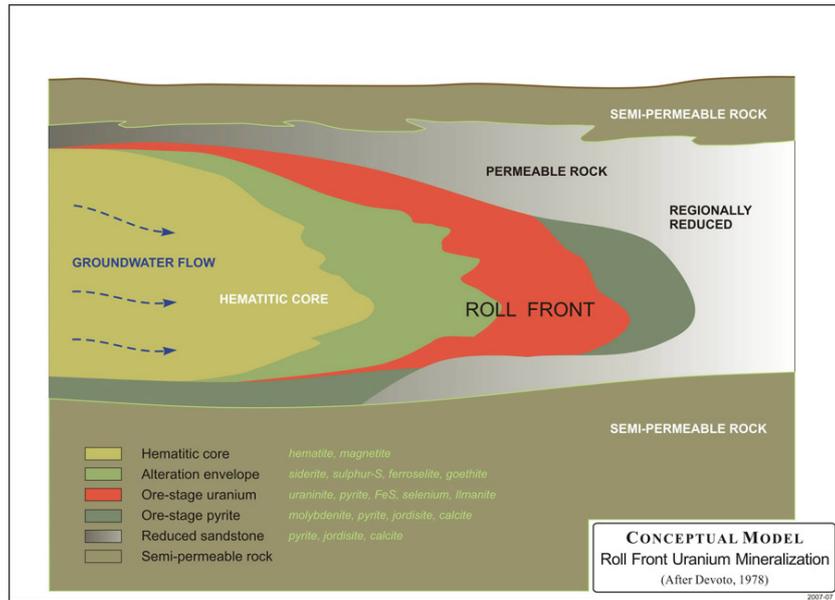
Source: Jefferson et al. 2007

### Sandstone hosted deposits

The second most important type of uranium mineralisation, in terms of grade and tonnage, is sandstone type or roll front deposits. They can vary in size and grade as shown in Exhibit 26. Sedimentary basins in which medium- to coarse-grained sandstones are deposited can yield significant uranium ore horizons if bounded by less permeable horizons. These impermeable horizons can be shale or mudstone units and often occur as a trap for the mineralised sandstone. In the case of sandstone deposits there are a variety of reducing agents that react with uranium and cause the formation of uranium minerals. Common reducing agents are carbonaceous material, sulphides, hydrocarbons and interbedded volcanics.

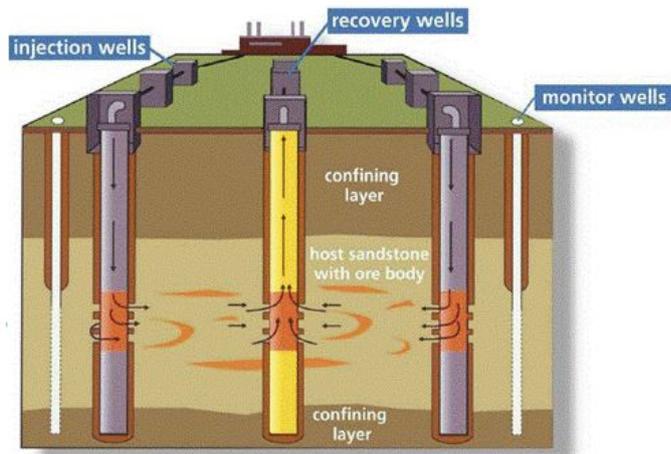
While sandstone deposits make up about only 18% of the world’s uranium resources they constitute more than half of the world’s production. Deposits of this type commonly have uranium content that is considered low to medium grade (c 0.05-0.4% U<sub>3</sub>O<sub>8</sub>). However, these types of deposits can be amenable to low-cost in-situ leaching (ISL) recovery methods under favourable hydrological conditions. In 2011, approximately 54% of total global production was from sandstone deposits. Most of the ISL production is from sandstone deposits in Kazakhstan and the US.

**Exhibit 28: Characteristics of sandstone hosted deposits**



Source: Devoto 1978

**Exhibit 29: In-situ recovery process from sandstone hosted deposits**



Source: : Devoto 1978

**Surficial deposits (calcrete type)**

Surficial uranium deposits are broadly defined as young (Tertiary to recent) near-surface uranium concentrations in unconsolidated sediments or soils. These deposits usually have secondary cementing minerals including calcite, gypsum, dolomite, ferric oxide and halite. Uranium deposits in calcrete (calcium and magnesium carbonates) are the largest of the surficial deposits. The calcrete bodies are interbedded with Tertiary sand and clay, which are usually cemented by calcium and magnesium carbonates. Calcrete deposits form in regions where uranium-rich granites were deeply weathered in a semi-arid to arid climate. Surficial uranium deposits also occur in peat bogs and karst caverns.

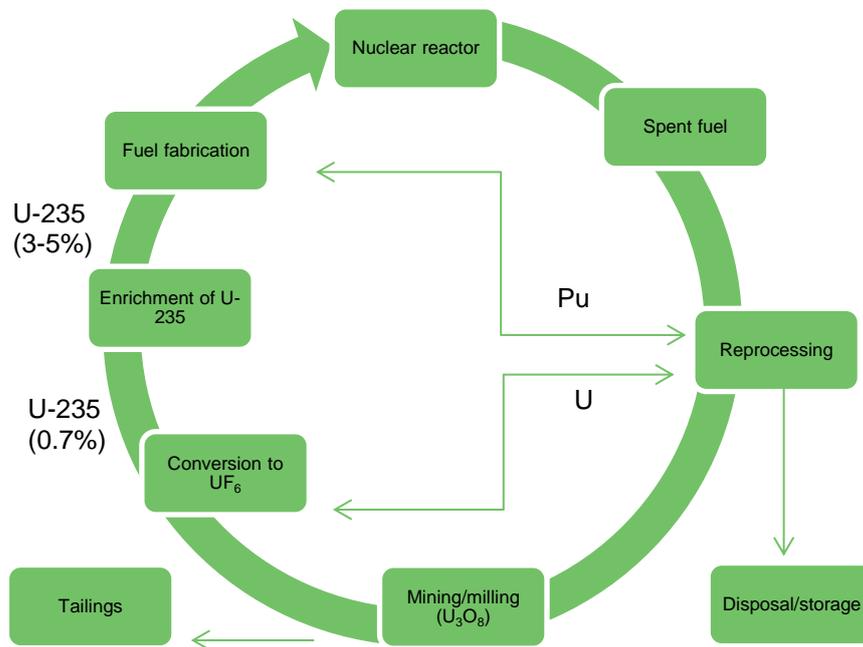
## Appendix: Uranium companies analysed but not profiled

**Exhibit 30: Companies analysed**

A-Cap (ASX:ACB)	Forte Energy (ASX:FTE)
Alliance Resources (ASX:AGS)	Forum Uranium (CVE:FDC)
Alligator (ASX:AGE)	Greenland Minerals and Energy (ASX:GGG)
AREVA (EPA:AREVA)	International Enxco (CVE:IEC)
Athabasca Uranium (CVE:UAX)	Long Harbour Exploration (CVE:LHC)
Aura (TSE:ORA)	Manhattan Corp (ASX:MHC)
Bannerman (ASX:BMN)	Marenica Energy (ASX:MEY)
Berkeley Resources (ASX:BKY)	Macusani Yellowcake (CVE:YEL)
Black Range (ASX:BLR)	Mega Uranium (TSE:MGA)
Cameco (NYSE:CCJ)	NexGen Energy (CVE:NXE)
CanAlaska (CVE:CVV)	Paladin Energy (ASX:PDN)
Continental Precious Minerals (TSE:CZQ)	Powertech Uranium (TSE:PWE)
Deep Yellow (ASX:DYL)	Purepoint Uranium (CVE:PTU)
Energia Minerals (ASX:EMX)	Stonehenge Metals (ASX:SHE)
Energy Metals (ASX:EME)	Uranium Resources (NASDAQ:URRE)
Fission Uranium Corp (CVE:FCU)	Uravan Minerals Inc. (CVE:UVN)
Forsys Metals (TSE:FSY)	

Source: Edison Investment Research

## Appendix: Uranium fuel cycle





## Company profiles

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# Denison Mines

Well positioned for the next upswing

Denison Mines is a well-funded uranium exploration and development company with a diversified portfolio of projects in Canada, Zambia, Namibia and Mongolia. Despite its recent acquisition of Rockgate Capital's Falea project in Mali, we believe management's strategy is focused on the continued development of its numerous projects in the prolific Athabasca Basin region of Saskatchewan, including the high-grade Phoenix deposit. This is reflected in Denison's C\$15m exploration budget for 19 of its 46 projects in the basin, with the Wheeler River project being the primary focus. Given its strong exploration upside, access to uranium processing and marketing facilities, we see Denison as a potential takeover target.

Year end	Revenue (US\$m)	PBT (US\$m)	EPS (US\$)	DPS (US\$)	P/E (x)	Yield (%)
12/12	11.1	(29.3)	(0.07)	0.00	N/A	N/A
12/13e	10.7	(61.3)	(0.11)	0.00	N/A	N/A
12/14e	11.4	(22.9)	(0.43)	0.00	N/A	N/A
12/15e	16.7	(18.7)	(0.03)	0.00	N/A	N/A

Source: Company data (continuing operations), Bloomberg consensus estimates (17/02/14).

## High-grade deposits and access to milling facilities

Aside from its recent acquisition, management is focused on its high-grade deposits and milling facilities in the Athabasca Basin. Denison's 60%-owned Wheeler River project hosts the Phoenix deposit, which has an indicated resource of 152,400t at 15.6% U<sub>3</sub>O<sub>8</sub> and is located 35km from the McArthur River mine. In addition, Denison owns 22.5% of the McClean Lake mill, which is capable of milling high-grade ore and is expected to be processing Cigar Lake ore from early H114, generating cash flow for the company.

## Acquisition of Rockgate Capital

On 17 September, Denison announced an all-share offer for Rockgate Capital's 100%-owned Falea uranium-silver-copper project in Mali, valued at C\$27m (22.4m Denison shares at C\$1.22/share). Under the terms of the agreement, each common share was exchanged for 0.192 of a Denison common share. As of 16 January 2014, Denison has acquired all of the outstanding Rockgate shares. When considering the uranium resources only, the transaction implies an EV/resource multiple of US\$0.21/lb, which is below the global average of US\$4.7/lb based on recent M&A transactions.

## Outlook: Quality assets suggest takeover potential

Despite the current uranium market conditions, Denison is well positioned with a diversified portfolio leveraged to any upside in the uranium market, given its 22.5% ownership of the McClean Lake mill and its high-quality assets in the Athabasca Basin. Given its unique position in the uranium exploration and development space, we see Denison as a potential takeover target. In this respect, we note premium valuations that the Canadian assets attract as a result of the ongoing uranium industry consolidation.

25 February 2014

**Price** **US\$1.4**  
**Market cap** **US\$653m**

Net cash (US\$m) as at September 2013	27.9
Shares in issue	472.8m
Free float	87%
Code	DML
Primary exchange	TSX
Secondary exchange	NYSE

### Share price performance



52-week high/low **US\$1.58** **US\$1.03**

### Business description

Denison Mines is an exploration and development company with a diversified portfolio of uranium assets. It has an interest in the McClean Lake mill operation and manages the Uranium Participation Corporation, which invests in physical uranium.

### Catalysts/next events

Continued exploration on Athabasca Basin projects	Winter 2014
Possible spin-off of non-core assets	Pending market conditions

### Analysts

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**Exhibit 1: Compliant resources of Denison Mines**

Project	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )
Mutanga	100%	1.88	0.00	1.99	8.40	0.00	5.82	65.20	0.0003	41.49
Wheeler River (Phoenix A&B)	60%	--	--	--	0.15	0.16	52.28	0.01	0.30	7.62
Waterbury J Zone	60%	--	--	--	0.31	0.02	10.28	0.14	0.01	2.75
Sue E	22.5%	--	--	--	--	--	--	0.48	0.01	7.35
Sue D	22.5%	--	--	--	0.12	0.01	2.84	0.02	0.00	0.21
MacLean North	22.5%	--	--	--	0.21	0.03	12.52	0.00	0.01	0.06
Caribou	22.5%	--	--	--	0.04	0.03	2.73	--	--	--
Hairhan	70.0%	--	--	--	12.26	0.00	18.92	5.54	0.00	6.10
Midwest	25.2%	--	--	--	0.35	0.06	42.93	0.03	0.01	0.44
Midwest A	25.2%	--	--	--	0.46	0.01	5.83	0.01	0.21	4.31
<b>Total attributable</b>	<b>--</b>	<b>1.9</b>	<b>--</b>	<b>2.0</b>	<b>19.3</b>	<b>--</b>	<b>78.4</b>	<b>77.8</b>	<b>--</b>	<b>78.9</b>

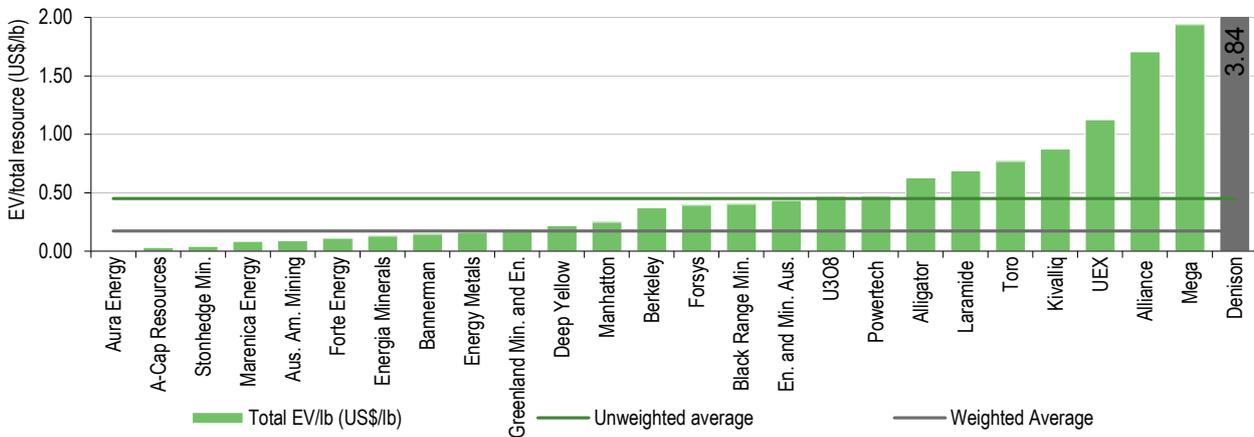
Source: Company reports

**Exhibit 2: Location of Denison Mines' Athabasca Basin-based projects**



Source: Denison Mines

**Exhibit 3: EV/resource comparison for uranium explorers (US\$/lb)**



Source: Edison Investment Research. Note: Prices as at 17 February 2014.

# Energy Fuels

Made in the USA

Energy Fuels (EFR) operates the White Mesa mill in Utah, which is the only conventional uranium mill in the US. Given the prevailing weak market conditions, EFR is constraining production and optimising its pipeline of uranium projects. As a result, we expect EFR to be well positioned to ramp up production once demand and prices improve. With its recent acquisition of Strathmore Minerals, EFR could become a dominant player in the US and a mid-tier global producer.

Year end	Revenue (US\$m)	PBT (US\$m)	EPS (US\$)	DPS (US\$)	P/E (x)	Yield (%)
09/12	25.0	1.53	0.5	0.0	20.7	N/A
09/13	72.5	(83.9)	(0.5)	0.0	N/A	N/A
09/14e	46.9	(0.3)	(0.02)	0.0	N/A	N/A
09/15e	62.7	14.0	0.5	0.0	20.7	N/A

Source: Company data; Bloomberg consensus estimates (17/02/14).

## Only conventional uranium mill in the US

EFR's 100%-owned White Mesa mill is the only conventional mill in operation within the US and has the capacity to produce up to 8Mlb U<sub>3</sub>O<sub>8</sub> per annum. In addition, the mill has a co-recovery vanadium circuit, as vanadium is commonly found in the uranium bearing ore from the Colorado Plateau area. More importantly, the mill is the only facility in North America with the current capability to process low-cost alternate feeds such as uranium bearing tailings or residues from uranium conversion. During FY13, EFR produced 1.2Mlb of U<sub>3</sub>O<sub>8</sub>, making it the second largest US producer and it has the potential to increase its annual production as market conditions improve.

## Recent acquisition of Strathmore Minerals

On 3 September 2013, EFR announced the completion of the all share acquisition of Strathmore Minerals, in which Strathmore shareholders received 1.47 common shares of Energy Fuels for each share of Strathmore. As a result of this deal, EFR acquired Strathmore's 60% interest in the 28.7Mlb U<sub>3</sub>O<sub>8</sub> Roca Honda project, which is within trucking distance to the White Mesa mill, and the 10.9Mlb U<sub>3</sub>O<sub>8</sub> Gas Hills project located near EFR's Sheep Mountain project in Wyoming. The deal makes EFR one of the largest players in the US uranium market with an overall resource at 127Mlb of U<sub>3</sub>O<sub>8</sub> (when considering all measured, indicated and inferred categories).

## Outlook: Tightening supply-demand balance

Given the current depressed uranium prices, EFR will continue to evaluate market conditions and adjust its operations accordingly. The company guides FY14e production of 0.4-0.5Mlb (c 50% reduction from FY13) with an additional 0.3Mlb purchased at spot market prices to fulfil existing sales contracts. We expect to see higher production rates should prices improve on the back of potential restart of some Japanese reactors and the recent expiration of the HEU agreement.

25 February 2014

**Price** **US\$9.2**  
**Market cap** **US\$181m**

Net debt (US\$m) as at September 2013	10.2
Shares in issue	19.6m
Free float (Bloomberg)	94%
Code	EFR
Primary exchange	TSX
Secondary exchange	NYSE

### Share price performance



52-week high/low US\$11.50 US\$4.98

### Business description

Energy Fuels is a fully integrated producer of both uranium and vanadium. The company is the largest conventional producer, supplying approximately 25% of the uranium produced in the US. Energy Fuels also has an extensive list of permitted mines and development projects.

### Catalysts/next events

Development of Sheep Mountain, Roca Honda and Henry Mountains projects	2014
Production ramp up	Subject to market

### Analysts

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**Exhibit 1: Energy Fuels compliant resources**

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )
San Rafael	100.00%	--	--	--	0.7	0.23%	3.4	0.4	0.21%	1.9
Whirlwind	100.00%	--	--	--	0.2	0.30%	1.0	0.4	0.23%	2.0
Juniper Ridge	100.00%	--	--	--	3.8	0.06%	5.2	--	--	--
Energy Queen	100.00%	0.1	0.29%	0.8	0.1	0.35%	0.6	0.1	0.27%	0.4
Sage Plain	50.00%	0.6	0.22%	2.7	0.0	0.32%	0.2	0.0	0.18%	0.2
Sheep Mountain	100.00%	--	--	--	11.7	0.12%	30.2	--	---	--
Henry Mountains	100.00%	--	--	--	2.2	0.27%	13.0	1.5	0.25%	8.1
Torbyn	100.00%	--	--	--	0.0	0.18%	0.1	0.0	0.22%	0.1
Daneros	100.00%	--	--	--	--	--	--	0.1	0.21%	0.7
EZ1	100.00%	--	--	--	0.1	0.51%	1.1	0.1	0.51%	1.2
EZ2	100.00%	--	--	--	0.1	0.43%	1.0	0.1	0.43%	1.1
Canyon	100.00%	--	--	--	--	--	--	0.1	1.08%	1.5
Pinenut	100.00%	--	--	--	--	--	--	0.1	0.44%	0.9
Arizona	100.00%	--	--	--	--	--	--	0.1	0.68%	1.0
Roca Honda	60.00%	0.3	0.40%	2.2	1.6	0.41%	14.5	1.3	0.41%	11.9
Sky	100.00%	--	--	--	0.6	0.07%	0.9	0.0	0.05%	0.1
Gas Hills	100.00%	--	--	--	2.087	0.13%	6.0	3.5	0.07%	5.5
Nose Rock	100.00%	0.3	0.15%	0.9	0.5	0.15%	1.7	0.2	0.14%	0.5
Dalton Pass	100.00%	0.4	0.09%	0.8	1.1	0.10%	2.2	0.8	0.08%	1.5
Marquez	100.00%	0.9	0.13%	2.5	2.4	0.13%	6.6	2.0	0.08%	3.6
<b>Total attributable</b>		<b>2.1</b>	<b>--</b>	<b>7.7</b>	<b>26.42</b>	<b>--</b>	<b>81.9</b>	<b>10.27</b>	<b>--</b>	<b>37.10</b>

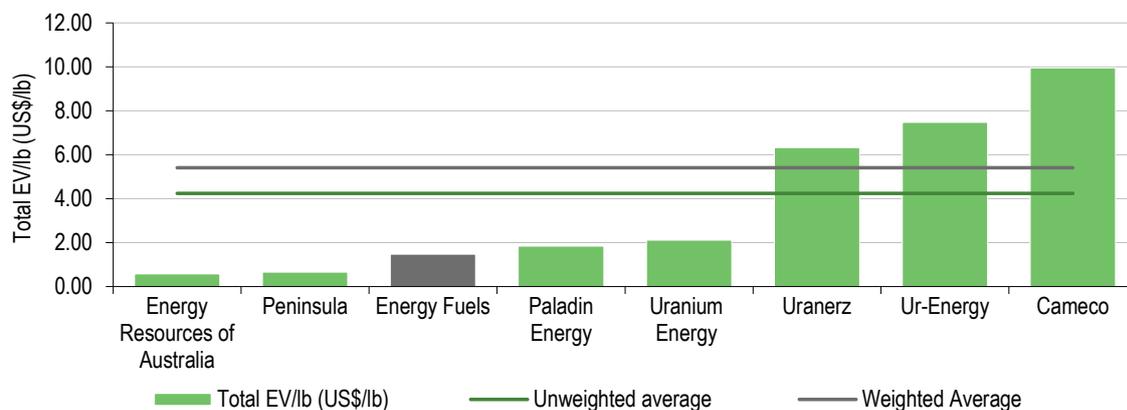
Source: Company reports

**Exhibit 2: Location of Energy Fuels' projects**



Source: Company report

**Exhibit 3: EV/resource peer comparison for the selected uranium producers (US\$/lb)**



Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

# Kivalliq Energy

## Highly prospective land package

Kivalliq Energy continues to de-risk its Angilak project in Nunavut through evaluation of potential extraction and processing options from several mineralised zones. Preliminary metallurgical and beneficiation studies suggest high U<sub>3</sub>O<sub>8</sub> recovery rates and a low impurity end product. With several mineralised zones already identified within the Lac 50 Trend the company believes the Angilak project could prove to be district scale mineralisation. Given the high grade of mineralisation relative to other projects outside of the Athabasca Basin, we believe Kivalliq could be an attractive acquisition target due to its quality assets and close proximity to AREVA's Kiggavik project

Year end	Revenue (C\$m)	PBT (C\$m)	EPS (C\$)	DPS (C\$)	P/E (x)	Yield (%)
09/11	0.0	(2.6)	(0.02)	0.0	N/A	N/A
09/12	0.0	(3.2)	(0.04)	0.0	N/A	N/A
09/13	0.0	(1.8)	(0.01)	0.0	N/A	N/A

Source: Company data

### Assets: Lac 50 Trend and more

Kivalliq's flagship is the Angilak project, which hosts the Lac 50 Trend, representing a 12km by 3km area that hosts numerous parallel mineralised zones. With an NI 43-101 compliant inferred resource of 2.8Mt grading 0.69% U<sub>3</sub>O<sub>8</sub> containing 43.3Mlb U<sub>3</sub>O<sub>8</sub> (using a cut-off of 0.2% U<sub>3</sub>O<sub>8</sub>), the Lac 50 Trend represents one of the highest grade uranium deposits outside of the Athabasca Basin. In October 2013, Kivalliq completed acquisition of the nearby Baker Basin Uranium, which holds 232,262 acres on the southern boundary of the highly-prospective Baker Lake Basin. More recently, Kivalliq has staked 36 mineral claims (the Genesis property) north-east of the Athabasca Basin covering 28 historic uranium showings and several uraniumiferous boulder trains. This property is located 25km from the Eagle Point uranium mine and Rabbit Lake mill operated by Cameco.

### Challenges: Remote access requires scale

We see developing a project in the arctic with limited infrastructure as a significant challenge requiring a deposit in the order of 100Mlb to be economical. That said, we note that Kivalliq's extensive land package and exploration upside could potentially achieve a world-class deposit.

### Outlook: Attractive acquisition target

While Kivalliq currently has an inferred resource of 43.3Mlb U<sub>3</sub>O<sub>8</sub> we note that the company has substantial land holdings in Nunavut that are highly perspective for identifying additional uranium resources. All in all, given the quality of its asset base, in particular, the high grade of mineralisation (0.69% U<sub>3</sub>O<sub>8</sub>) relative to other projects outside of the Athabasca Basin, and subject to further exploration success, we believe Kivalliq could be an attractive acquisition target. When considering the ongoing consolidation of the uranium industry, we note a substantial premium that has been paid for Canadian uranium assets given their high grade of U<sub>3</sub>O<sub>8</sub> relative to some other jurisdictions.

25 February 2014

**Price** **C\$0.24**  
**Market cap** **C\$46m**

Net cash (C\$m) as at 30 September 2013	3.0
Shares in issue	191m
Free float (Bloomberg)	95%
Code	KIV
Primary exchange	TSX-V
Secondary exchange	N/A

### Share price performance



52-week high/low US\$0.36 US\$0.18

### Business description

Kivalliq Energy Corporation is a Vancouver-based uranium exploration company advancing Canada's highest grade uranium deposit (0.69% U<sub>3</sub>O<sub>8</sub>) outside of Saskatchewan's Athabasca Basin. In addition, the company has recently acquired highly prospective holdings in the Baker Lake basin as well as north-east of the Athabasca basin.

### Next events

Expansion of resource base	Ongoing
Exploration of Genesis property	2014/15

### Analysts

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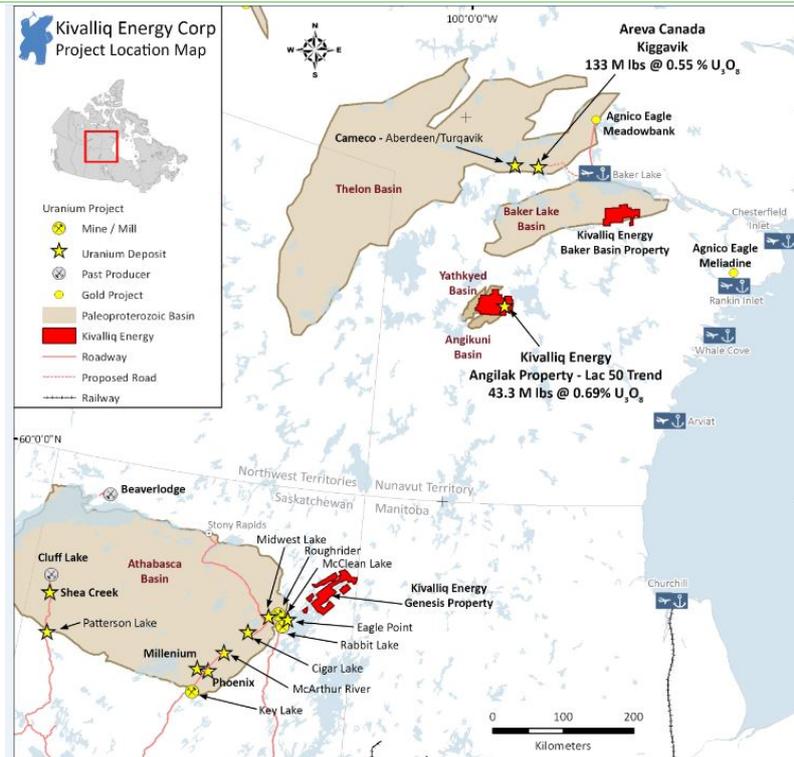
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**Exhibit 1: Kivalliq Energy's compliant resources**

Deposit (Lac 50 Trend)	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )
Lac Cinquante	100	--	--	--	--	--	--	1.9	0.67	28.0
J4/Ray								0.9	0.75	15.3
<b>Total attributable</b>	<b>100</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>43.3</b>

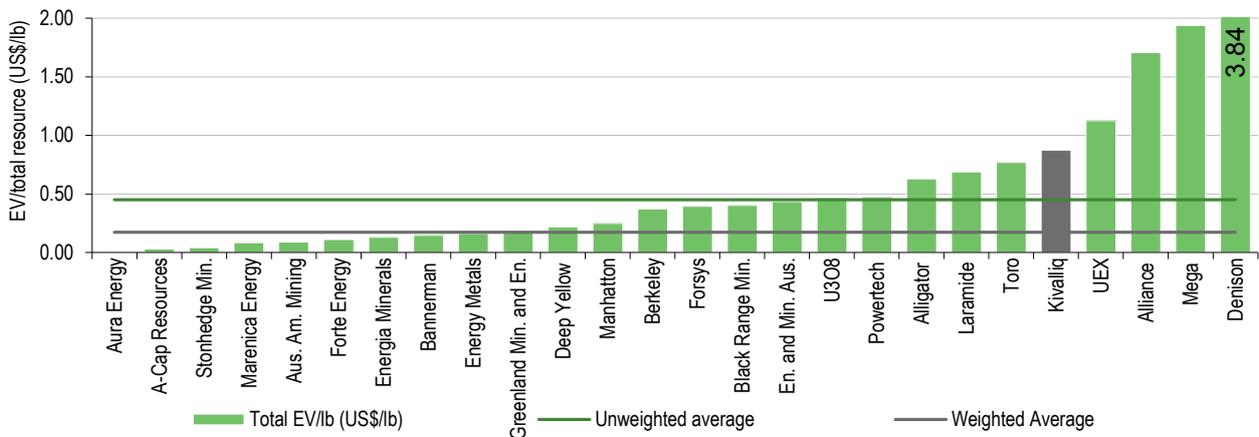
Source: Company reports

**Exhibit 2: Location of Kivalliq Energy projects**



Source: Company report

**Exhibit 5: EV/resource peer comparison for the uranium explorers (US\$/lb)**



Source: Company reports, Edison Investment Research. Note: Prices as at 14 February.

# Laramide Resources

## Long pipeline of projects

Laramide Resources continues to develop its Westmoreland uranium project, one of the largest deposits in Australia. In October 2012, the Queensland government lifted the ban on uranium mining. Since then, Laramide has been focused on bringing the near-surface deposit comprising 51.9Mlb of U<sub>3</sub>O<sub>8</sub> into production. Laramide also has a joint venture agreement with Rio Tinto in a highly prospective area that lies along strike with Westmoreland. Laramide also owns a royalty portfolio in New Mexico that covers Uranium Resources' Churchrock project.

Year end	Revenue (C\$m)	PBT (C\$m)	EPS (C\$)	DPS (C\$)	P/E (x)	Yield (%)
12/11	0.00	(4.41)	(0.06)	0.0	N/A	N/A
12/12	0.00	(3.28)	(0.05)	0.0	N/A	N/A

Source: Company accounts

### Australian assets: Westmoreland project

Laramide's flagship project is the Westmoreland project, a sandstone-hosted and open-pitabile deposit with a total resource of 51.9Mlb U<sub>3</sub>O<sub>8</sub> grading at 0.089% U<sub>3</sub>O<sub>8</sub>. The company hopes to expand the overall resource size and advance the project to production. It is also engaged with several joint venture agreements in the Northern Territory and NW Queensland.

### US assets: La Sal and La Jara Mesa

Laramide also owns two development-stage assets, La Sal and La Jara Mesa, in the US. In its portfolio, Laramide has strategic positions and several uranium royalties in the Grants Mineral District of New Mexico, US. La Jara Mesa has a compliant resource estimate of 10.3Mlb U<sub>3</sub>O<sub>8</sub> and the project is currently progressing through the permitting and consultation process. A decision is expected in 2014 and if approved would allow underground development and mine production. The La Sal project is located c 100km from Energy Fuel's White Mesa Mill. The project has been fully permitted for a bulk sampling programme and Laramide has a toll milling agreement in place with Energy Fuels to process the material. A commercial mining permit will be required after the bulk sampling programme has been completed.

### Outlook: Potential near-term cash flow

While Laramide is focused on advancing its flagship Westmoreland project, it could achieve a near-term cash flow following the commencement of production at its La Sal project in Utah and from its royalty agreement with Uranium Resources if it begins production at its Churchrock property. Small-scale production at the La Sal project could be launched now that permits have been approved and a toll milling agreement is in place with Energy Fuels' White Mesa processing facility. As visibility on the cash flow generation improves, the company might enjoy a valuation premium that the market normally attributes to producing assets.

25 February 2014

**Price** **C\$0.6**  
**Market cap** **C\$44m**

Net debt (C\$m) as at 30 September 2013	4.4
Shares in issue	78.3m
Free float	87.5%
Code	LAM
Primary exchange	TSX
Secondary exchange	ASX

### Share price performance



52-week high/low C\$0.93 C\$0.33

### Business description

Laramide Resources is a mineral resource company, which specialises in the acquisition, discovery and development of uranium projects. Laramide's current main focus is the Westmoreland uranium project in Queensland, Australia.

### Catalysts/next events

Updated scoping study on Westmoreland project	2014
Commencement of permitting process	2014

### Analysts

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**Exhibit 1: Laramide's compliant resource estimate**

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )
Westmoreland	100	--	--	--	18.7	0.09	36.26	9.0	0.08	15.91
La Jera Mesa	100	--	--	--	1.4	0.23	7.16	0.7	0.20	3.17
<b>Total attributable</b>					<b>20</b>		<b>43.42</b>	<b>10</b>		<b>19.09</b>

Source: Company report

**Exhibit 2: Location of Laramide's Westmoreland project and JV projects in Australia**



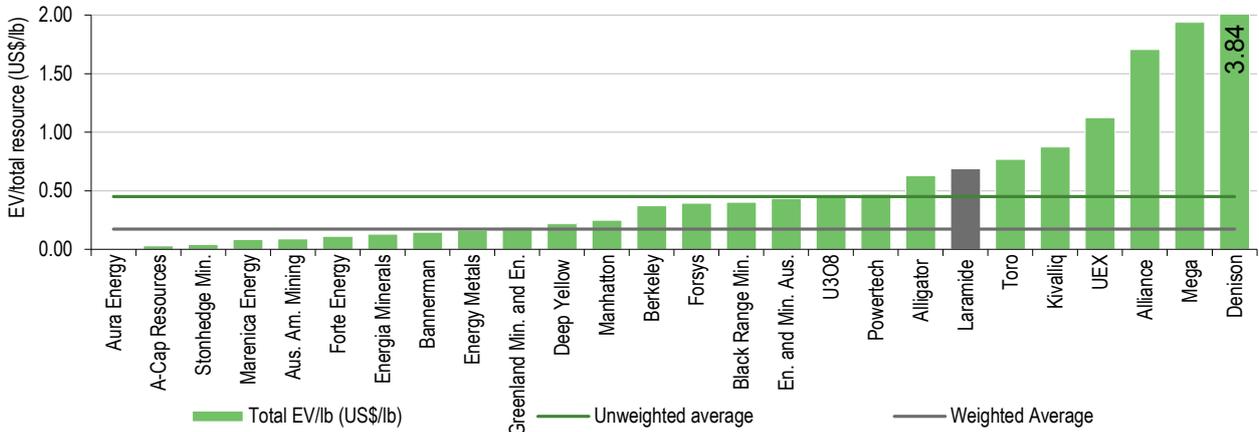
Source: Company reports

**Exhibit 3: Locations of Laramide's US assets**



Source: Company reports

**Exhibit 4: EV/resource comparison for the uranium explorers (US\$/lb)**



Source: Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

# Peninsula Energy

Near-term producer

Peninsula Energy is continuing pre-licence construction on its Lance uranium project in Wyoming while waiting for final approval, which is scheduled for late March 2014. Subject to licence approval and funding, management guides production could occur before the end of 2014. We believe Peninsula is well placed in the uranium sector given its advanced stage, low capital cost and low cash costs once the demand and price improve. We believe the spot U<sub>3</sub>O<sub>8</sub> price has bottomed out and expect it to recover in the short term on the back of the tightening supply-demand balance.

Year end	Revenue (US\$m)	PBT (US\$m)	EPS (USc)	DPS (US\$)	P/E (x)	Yield (%)
06/13	0.0	(14.6)	(0.5)	0.0	N/A	N/A
06/14e	0.0	(12.0)	(0.6)	0.0	N/A	N/A
06/15e	31.7	(20.2)	(0.7)	0.0	N/A	N/A
06/16e	83.4	(1.1)	(0.2)	0.0	N/A	N/A

Source: Company data; Bloomberg consensus estimates

## Assets: Uranium projects in US and South Africa

Peninsula has two assets: its flagship project is the Lance ISL project situated in the Powder River Basin in Wyoming and the other is the Karoo sandstone-hosted deposit in South Africa. The Lance project comprises a series of roll-front uranium deposits that is amenable to low capex and low cost in situ leaching. The region already has a number of operating projects with proven track records. To date, the Lance project has a compliant resource of 54Mlb of U<sub>3</sub>O<sub>8</sub> grading 0.05% U<sub>3</sub>O<sub>8</sub>. The Karoo project is located in a known uranium and molybdenum mineralised province.

## In the run-up to production

The source material licence (SML) remains the final permit required before full construction of the plant and well fields can begin. As Peninsula has satisfied all conditions and given that there are several mines and ISL plants already operating in Wyoming, the company expects to have the licence approved by end Q114. An initial capex of US\$64m is forecast for Stage 1 (1.3Mlb pa), with an overall development cost of US\$114m (2.3Mlb pa). The recently completed optimisation study suggests a very competitive steady-state opex of US\$31/lb. Subject to financing and granting of the SML, commercial production is planned for H214.

## Outlook: Aggressive growth profile

Peninsula is targeting ISL production from its Lance project by the end of 2014 at an initial annual run rate of 1.2Mlb pa (Ross unit), with a subsequent expansion to 2.3Mlb from 2017 (Kendrick unit). Development of conventional mining and milling at the Karoo project is targeted for 2017/18, with an exploration target of c 250-350Mlb U<sub>3</sub>O<sub>8</sub> to be defined while the project advances. In addition to its organic growth, the company has identified several strategic projects in Australia to develop a further 3-4Mlb pa to meet its annual production target of 8-10Mlb U<sub>3</sub>O<sub>8</sub> before 2022.

25 February 2014

**Price** **A\$0.02**  
**Market cap** **A\$75m**

Net cash (A\$m) as at 30 June 2013	1.7
Shares in issue	3,252m
Free float	86%
Code	PEN
Primary exchange	ASX
Secondary exchange	N/A

### Share price performance



52-week high/low A\$0.034 A\$0.02

### Business description

Peninsula Energy is a uranium exploration and development company focused on production from its Lance project located in the Powder River Basin of Wyoming. The company also owns the Karoo uranium/molybdenum project located in the Republic of South Africa.

### Catalysts

Lance production	Q414
Karoo PFS	H214

### Analysts

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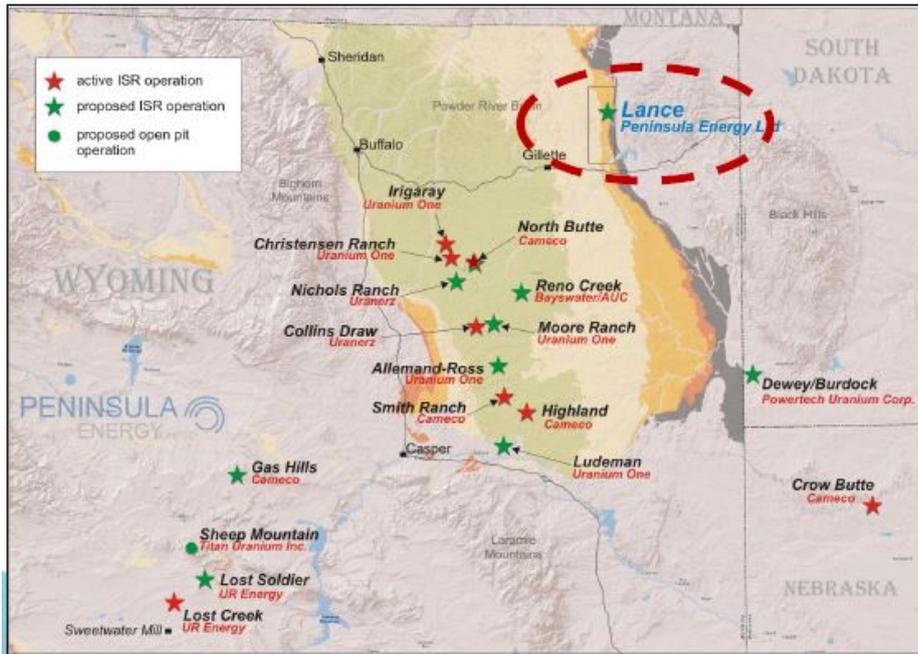
[mining@edisongroup.com](mailto:mining@edisongroup.com)

**Exhibit 1: Peninsula Energy's compliant resources**

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )
Lance	100	4.1	0.05	4.5	11.6	0.05	12.7	35.5	0.05	36.5
Karoo	74	--	--	--	6.9	0.10	15.7	14.8	0.10	34.4
<b>Total attributable</b>				<b>4.5</b>			<b>28.4</b>			<b>70.9</b>

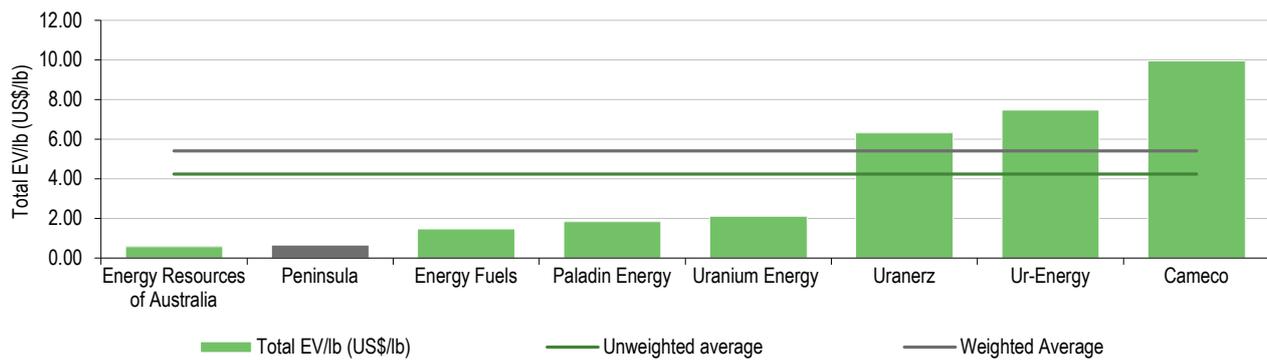
Source: Peninsula Energy

**Exhibit 2: Location of Peninsula's Lance project in the Powder River Basin**



Source: Company reports

**Exhibit 3: EV/resource peer valuation comparison for the producing companies (US\$/lb)**



Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

# Toro Energy

Emerging Australian producer

With two key deposits of its 100%-owned Wiluna project fully permitted, Toro Energy could be operating Western Australia's first uranium mine in the near term. Notwithstanding financing risks and uranium market conditions, Toro is targeting production in 2016. While finalising phase 2 of its DFS in FY14, Toro will be exploring options to fund the estimated A\$269m capital expenditure required for the project. In the meantime, Toro continues to de-risk the project through optimisation and integration studies. Given Toro's advanced development and approved permits, we expect the company to benefit once uranium demand and prices improve.

Year end	Revenue (A\$m)	PBT (A\$m)	EPS (A\$)	DPS (A\$)	P/E (x)	Yield (%)
12/13	0.0	(6.9)	(0.01)	0.0	N/A	N/A
12/14e	0.0	(7.5)	(0.01)	0.0	N/A	N/A
12/15e	0.0	(13.0)	(0.01)	0.0	N/A	N/A
12/16e	59.2	4.7	0.002	0.0	33.0	N/A

Source: Bloomberg

## Fully permitted and phase 1 of DFS completed

In April 2013, Toro was granted final environmental permits for its Millipede and Centipede deposits in the Wiluna project area. Engineering and metallurgical studies have been completed, with reasonable capex and competitive operating costs estimates of A\$269m and US\$37/lb respectively to produce 1.7Mlb U<sub>3</sub>O<sub>8</sub> over 14 years. Toro is expecting to complete phase 2 of its DFS in 2014, which will focus on, among other things, integrating and optimising resources from the acquisition of the Lake Maitland project. Assuming favourable financing and market conditions, Toro expects to commence production in 2016.

## Acquisition of the Lake Maitland project

On 20 November 2013, Toro completed the acquisition of Mega Uranium's Lake Maitland uranium project. The transaction is an all-share deal (415m Toro ordinary shares with an implied value of A\$35m), which adds an additional compliant resource of 22Mlb of U<sub>3</sub>O<sub>8</sub>. Toro inherits two joint venture partners (Japan's JAURD and IMEA), which together have an option to acquire a 35% interest in the project. When also considering Toro's exploration-stage Theseus in situ recovery project and the advanced Wiluna project, the company has a total JORC-compliant resource of 76Mlb U<sub>3</sub>O<sub>8</sub>. Mega now owns 28% of Toro.

## Outlook: Optimisation studies and project finance

While financing risks remain for the estimated A\$269m capex required for the Wiluna project, Toro expects debt funding through offtake agreements and strategic partnerships to support the development of the Wiluna project. Through its strategic acquisition of the Lake Maitland project, Toro will now focus on the approval for the combined Millipede and Lake Maitland deposits.

25 February 2014

**Price** **A\$0.07**  
**Market cap** **A\$100m**

Net cash (A\$m) as at 31 December 2013	9.2
Shares in issue	1,518m
Free float	45%
Code	TOE
Primary exchange	ASX
Secondary exchange	N/A

### Share price performance



52-week high/low A\$0.13 A\$0.062

### Business description

Toro Energy is a uranium exploration and development company, with its 100%-owned Wiluna project located in Western Australia. Two of the three key deposits have approved mining licences. Toro also owns the Theseus ISR project and has acquired the nearby Lake Maitland project.

### Next events

Optimisation studies	December 2014
Project funding strategy	December 2014

### Analysts

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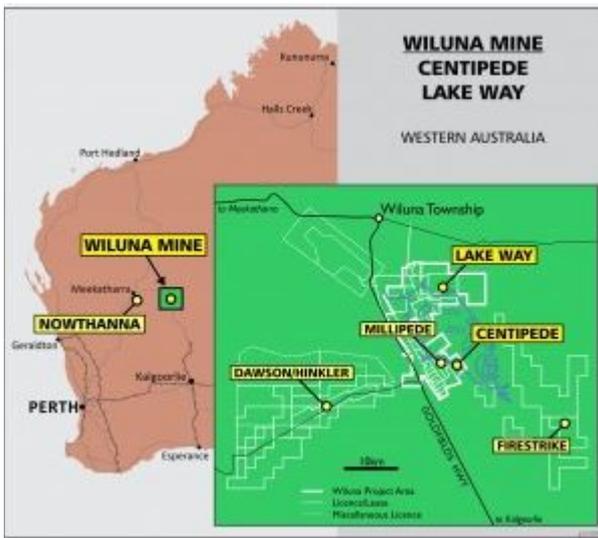
[mining@edisongroup.com](mailto:mining@edisongroup.com)

**Exhibit 1: Toro Energy's compliant resources (cut off of 0.02% U<sub>3</sub>O<sub>8</sub>)**

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )
Centipede	100	2.9	0.06	3.5	7.5	0.06	9.5	--	--	--
Lake Way	100	--	--	--	10.3	0.05	12.3	--	--	--
Millipede	100	--	--	--	4.5	0.05	5.3	1.9	0.04	1.6
Dawson Hinkler Well	100	--	--	--	8.4	0.03	6.2	5.2	0.03	3.2
Nowthanna	100	--	--	--	--	--	--	11.9	0.04	10.5
Lake Maitland	100	--	--	--	19.9	0.06	24.4	--	--	--
<b>Total attributable</b>	<b>--</b>	<b>2.9</b>	<b>0.06%</b>	<b>3.5</b>	<b>50.6</b>	<b>0.05</b>	<b>57.7</b>	<b>19.0</b>	<b>0.04</b>	<b>15.3</b>

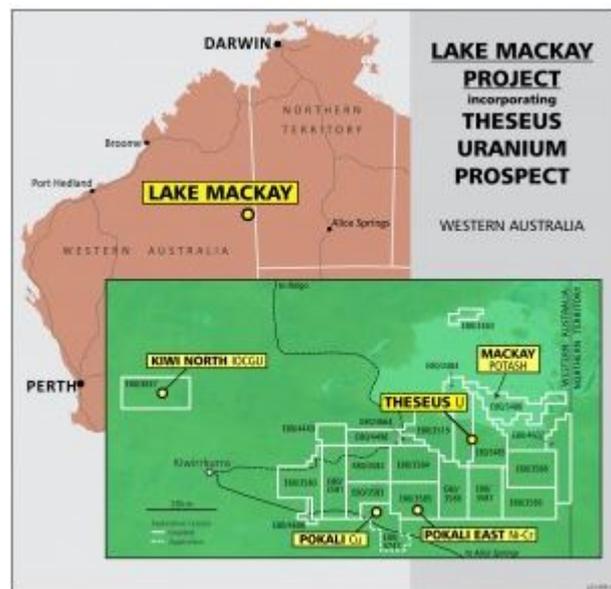
Source: Company reports November 2013

**Exhibit 2: Location map of Toro Energy's Wiluna deposit**



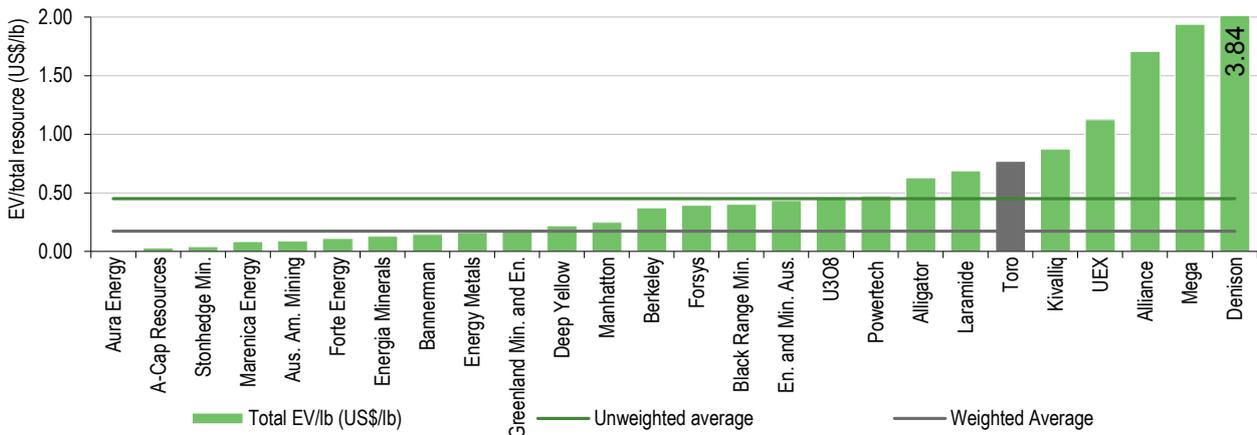
Source: Company report

**Exhibit 3: Location map Toro Energy's Lake Mackay project**



Source: Company report

**Exhibit 4: EV/resource peer comparison for uranium exploration companies (US\$/lb)**



Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

# UEX

## Strategic partnership

In partnership with AREVA, UEX owns 49.1% of the Shea Creek project, the largest undeveloped uranium resource in the Athabasca Basin. In addition, UEX owns 100% of the Hidden Bay project, which is located near the existing milling facility. Its exposure to the highly prospective Athabasca Basin could make UEX an important player on the regional M&A scene. Despite the current depressed uranium prices resulting in deferrals of some projects, we note that quality uranium exploration assets in the Athabasca Basin continue to attract a valuation premium.

Year end	Revenue (C\$m)	PBT (C\$m)	EPS (C\$)	DPS (C\$)	P/E (x)	Yield (%)
12/11	0.0	(4.7)	(0.03)	0.0	N/A	N/A
12/12	0.0	(4.0)	(0.02)	0.0	N/A	N/A

Source: Company reports

## Assets: Key focus on the Athabasca Basin

The Athabasca Basin, located in northern Saskatchewan, Canada contains most of the known high-grade uranium deposits and produces approximately 16% of the world's mined uranium. The Hidden Bay project, located on the eastern side of the basin, contains in excess of 35Mlb U<sub>3</sub>O<sub>8</sub> as indicated resources and 2.7Mlb U<sub>3</sub>O<sub>8</sub> as inferred resources, with a cut-off of 0.05% U<sub>3</sub>O<sub>8</sub>. On the western side of the basin, UEX has the option to increase its interest in the Shea Creek project to 49.9% by spending an additional C\$18m over a six-year period (US\$2m were spent in 2013, increasing the ownership to 49.1%). The deposit contains 68Mlb U<sub>3</sub>O<sub>8</sub> in the indicated category and 28Mlb in the inferred category, with an average grade of 1.5% U<sub>3</sub>O<sub>8</sub> and 1.0% U<sub>3</sub>O<sub>8</sub>. Of note is that the deposit remains open and additional resources could be defined given the sparse drilling in some areas along strike. UEX is actively involved in 17 uranium projects in the Athabasca Basin, either through sole ownership or joint venture partnerships totalling 264,363 hectares.

## Challenges

Given that Shea Creek is located on the western side of the basin, which lacks the infrastructure compared with the eastern side, development of the project will ultimately require higher uranium prices. However, we see potential for consolidation in the western side of the basin given the recent exploration success at the Patterson Lake South project located just south of the Shea Creek deposit. We believe UEX's Hidden Bay project could also be of strategic interest given its close proximity to existing processing facilities. While the project is likely too small to be developed on its own, we see opportunity for toll milling given that Cameco's Rabbit Lake mill is just 4km away.

## Outlook: Under new management

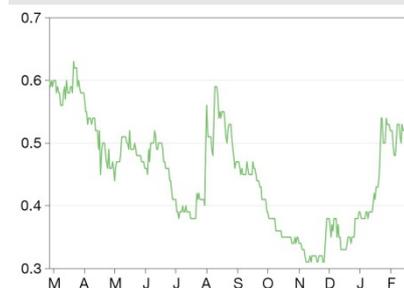
In January 2014, Roger Lemaitre took over as president and CEO of UEX following the retirement of Graham Thody. Mr Lemaitre has previously held several senior management positions at Cameco. This bodes well for UEX, given the company's strong presence on both sides of the Athabasca Basin, as well as the potential synergies thanks to Hidden Bay's proximity to the Rabbit Lake mill.

25 February 2014

**Price** **C\$0.50**  
**Market cap** **C\$114m**

Net cash (C\$m) as at 30 September 2013	12.0
Shares in issue	227.8m
Free float	77.4%
Code	UEX
Primary exchange	TSX
Secondary exchange	N/A

### Share price performance



52-week high/low C\$0.63 C\$0.31

### Business description

UEX Corporation has made advancements in the discovery and development of existing and new uranium deposits in the Athabasca Basin. UEX maintains strategic relationships with both Cameco Corporation and AREVA, the world's largest uranium companies.

### Catalysts/next events

Mineral resources expansion Ongoing

### Analysts

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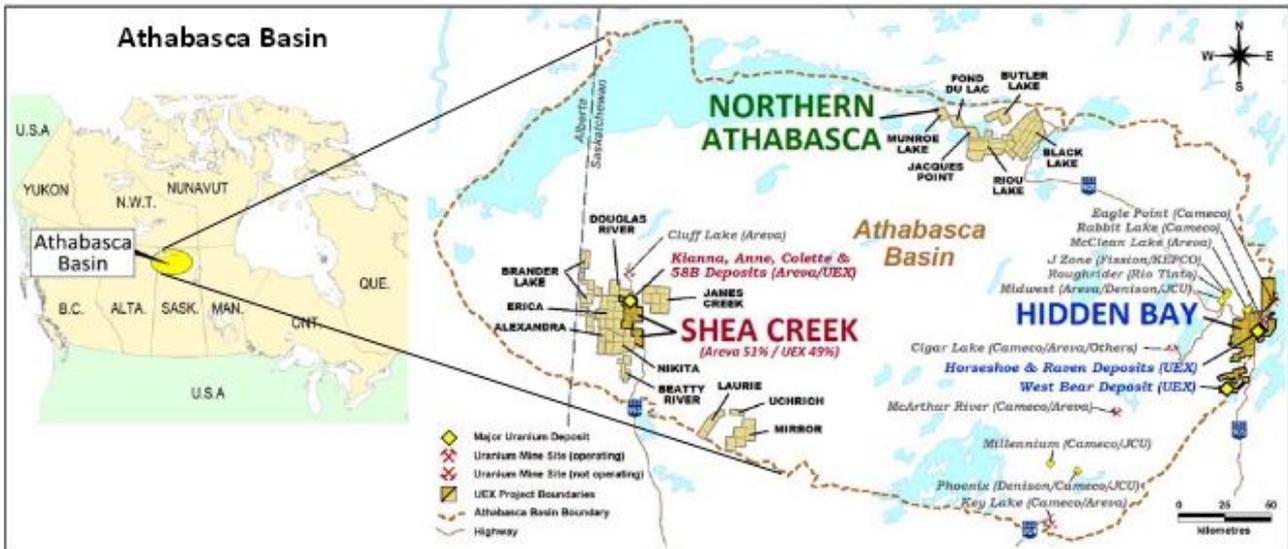
[mining@edisongroup.com](mailto:mining@edisongroup.com)

**Exhibit 1: UEX compliant resource estimates**

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )
Shea Creek	49	--	--	--	2.1	1.5	67.7	1.3	1.0	28.2
Hidden Bay	100	--	--	--	10.4	0.2	36.6	1.1	0.1	2.7
<b>Total attributable</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>11.4</b>	<b>--</b>	<b>69.8</b>	<b>1.7</b>	<b>--</b>	<b>16.5</b>

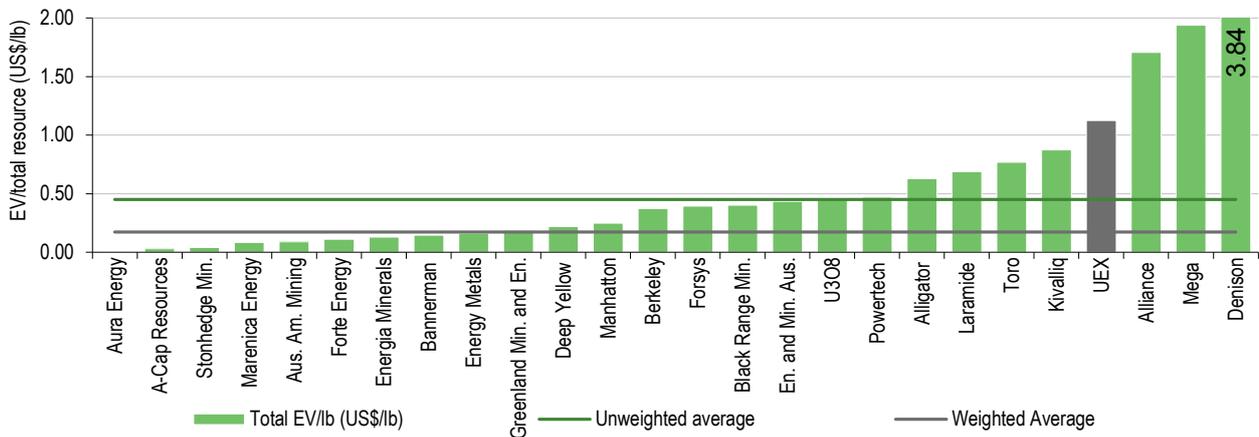
Source: Company reports

**Exhibit 2: Athabasca Basin with location of UEX's major assets relative to other major deposits or mines**



Source: Company reports

**Exhibit 3: Peer comparison of enterprise value and total resource (US\$/lb), UEX highlighted**



Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

# Uranerz Energy

The next US uranium producer

Uranerz has all of the necessary permits and funding required for production at its Nichols Ranch ISR project. The newly built ISR plant and adjacent well field have been essentially completed with only final adjustments being made to the automated control systems. On completion of a pre-operational inspection, Uranerz is poised to be the next US uranium producer. With a highly experienced management and operations team in place, we expect Uranerz to achieve production during Q114. With signed long-term offtake agreements, the company is well-positioned to weather the current market downturn.

Year end	Revenue (US\$m)	PBT (US\$m)	EPS (US\$)	DPS (US\$)	P/E (x)	Yield (%)
12/12	0.0	(14.9)	(0.19)	0.0	N/A	N/A
12/13e	0.0	(25.3)	(0.26)	0.0	N/A	N/A
12/14e	22.9	(2.6)	(0.07)	0.0	N/A	N/A
12/15e	38.1	(6.5)	(0.005)	0.0	N/A	N/A

Source: Bloomberg (17/02/14)

## Emerging uranium producer

Uranerz controls a strategic land package in the Powder River Basin in Wyoming, an area known as the largest uranium-producing region in the US. Its newly built Nichols Ranch processing facility is licensed for a maximum production of 2Mlb of U<sub>3</sub>O<sub>8</sub> pa. The company expects initial production levels in the order of 0.6-0.8Mlb U<sub>3</sub>O<sub>8</sub> following ramp-up once commercial production is established. In addition, Uranerz has signed a toll-processing agreement with Cameco. Given its large land package in the Powder River Basin, Uranerz could optimise synergies from a hub-and-spoke style operation centred on the Nichols Ranch facility. Importantly, the company has signed long-term offtake agreements with major US-based utilities, covering part of the planned production over a four- to five-year period.

## Challenges: Wading through the glut

With the current market oversupply that exists on the back of the shutdown of Japanese reactors, we expect the uranium spot price to remain capped until some of the reactors are approved for restart. While the timing remains unclear, we note that Uranerz should be in a position to weather the storm given its offtake agreements and the relatively low cost of ISL production.

## Outlook: Expanding pipeline

Once the Nichols Ranch facility is up and running and generating cash flow, it should give Uranerz an opportunity to focus on bringing its nearby satellite deposits up the curve to further improve its production profile. Availability of infrastructure should also support the potential expansion. Market consensus expects the company to break even at the EBITDA level in 2014, with further growth seen in 2015. In all, the upcoming successful commissioning of the Nichols Ranch project, coupled with the anticipated recovery in the uranium price, should be supportive of Uranerz's shares.

25 February 2014

**Price** US\$1.50m  
**Market cap** US\$129m

Net cash (US\$m) as at Jan 2014	1.5
Shares in issue	85.8m
Free float	91.5%
Code	URZ
Primary exchange	NYSE
Secondary exchange	TSX

## Share price performance



52-week high/low US\$1.68 US\$0.87

## Business description

Uranerz Energy is a uranium development and exploration company focused on ISL production from its Nichols Ranch facility located in the Powder River Basin of Wyoming. Uranerz's management has a successful track record of licensing, constructing and operating ISL uranium

## Catalysts

Commercial production at Nichols Ranch	Q114
Exploration of the satellite deposits	Ongoing

## Analysts

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Andrey Litvin	+44 (0)20 3077 5755

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### Exhibit 1: Compliant resources

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt% (U <sub>3</sub> O <sub>8</sub> ))	Mlb (U <sub>3</sub> O <sub>8</sub> )
Nichols Ranch	100	--	--	--	1.2	0.11	3.0	--	--	--
Hank	100	--	--	--	0.8	0.12	2.2	0.1	0.12	0.2
West North-Butte	100	--	--	--	0.8	0.15	2.8	1.0	0.12	2.7
South Doughstick	100	0.3	0.12	0.7	0.6	0.12	1.6	0.1	0.10	0.2
Doughstick Properties	100	0.1	0.09	0.3	0.4	0.08	0.7	0.1	0.06	0.1
North Rolling Pin	100	0.3	0.06	0.4	0.2	0.05	0.3	0.0	0.04	0.0
Reno Creek	100	2.1	0.06	2.8	1.4	0.05	1.5	0.2	0.04	0.1
<b>Total attributable</b>		<b>2.8</b>		<b>4.1</b>	<b>5.5</b>		<b>12.1</b>	<b>1.5</b>		<b>3.4</b>

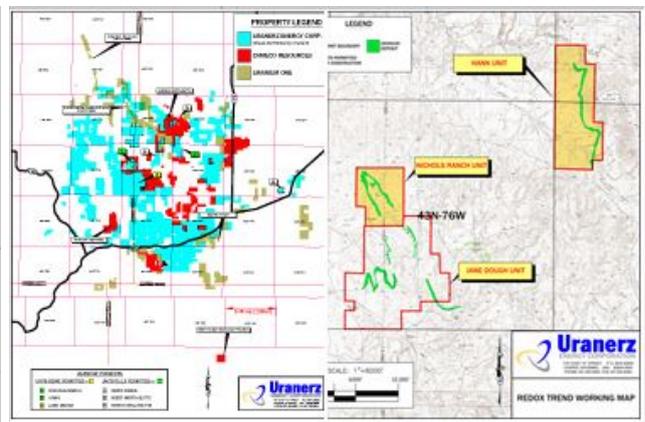
Source: Company reports

### Exhibit 2: Location of Uranerz's Powder River Basin projects



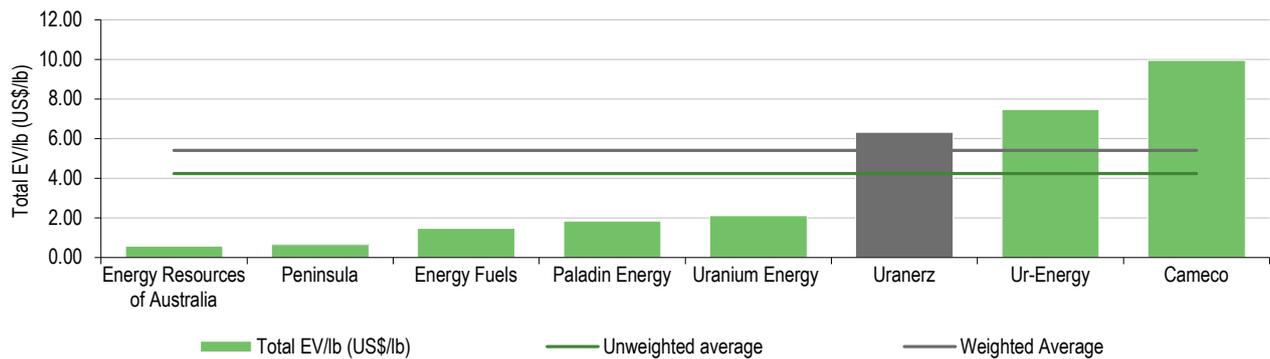
Source: Company reports

### Exhibit 3: Uranerz's land position within the central Powder River Basin



Source: Company reports

### Exhibit 4: Peer comparison of enterprise value and total resource (US\$/lb), Uranerz highlighted



Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

# Uranium Energy Corp

Emerging uranium producer

Uranium Energy (UEC) is a US-based emerging uranium producer. The company's portfolio comprises both ISR and conventional uranium projects in the US and Paraguay. Within the US, UEC is focused on a hub and spoke production strategy centred on its fully permitted Hobson processing plant with its 2Mlb of U<sub>3</sub>O<sub>8</sub> capacity per year. Given that the US is only c 10% self-sufficient in uranium for its nuclear reactors, we expect UEC to be well positioned to help fill the domestic supply gap.

Year end	Revenue (US\$m)	PBT (US\$m)	EPS (US\$)	DPS (US\$)	P/E (x)	Yield (%)
07/12	13.8	(25.1)	(0.32)	0.0	N/A	N/A
07/13	9.0	(21.9)	(0.26)	0.0	N/A	N/A
07/14e	10.1	(18.2)	(0.21)	0.0	N/A	N/A
07/15e	39.8	0.1	0.01	0.0	165	N/A

Source: Bloomberg

## Assets: Low-cost in-situ leach deposits

While UEC does have several projects located throughout the US, management is currently focused on its assets in Southwest Texas. The company is constructing its Goliad project and expects production to come online during 2014. In addition, UEC is continuing with resource delineation and production permit submissions at its Burke Hollow ISL project. UEC also has uranium projects in Paraguay: the Yuty project has a total resource of 11.1Mlb and has been deemed ISR amenable after initial aquifer testing; similarly, the Oviedo project is ISR amenable and has, according to the company, an exploration target of 23-56Mlb of U<sub>3</sub>O<sub>8</sub>.

## Challenges: Optimising operations

Given UEC's strong exposure to the spot uranium market and the current depressed market conditions, UEC has decided to defer capital expenditure for its Palangana production wellfields. Instead, it is focusing on launching the Goliad project and the resource delineation at its Burke Hollow ISL project. UEC's strong cash position and quality asset portfolio suggest the company is well positioned to act upon any possible acquisitions and/or monetise non-core assets.

## Outlook: Expanding the project pipeline

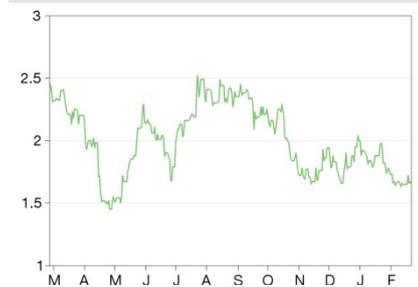
Unlike some of its competitors, UEC's production is sold through the spot market rather than through long-term contracts at more favourable rates. While this strategy may affect immediate cash flow generation given the current low uranium spot prices, the company should be in a better position to benefit from any upswing in the market. With a recently established US\$20m credit facility and a US\$7m (gross) equity raising, it is well supported to continue with its hub and spoke strategy. We expect to see higher production rates once uranium demand and prices improve on the back of Japan restarting some of its reactors, and the recent expiration of the HEU agreement.

25 February 2014

**Price** **US\$1.64**  
**Market cap** **US\$147m**

Net cash (US\$m) as at October 2013	7.3
Shares in issue	89.7m
Free float	94.2%
Code	UEC
Primary exchange	NYSE
Secondary exchange	FSX

### Share price performance



52-week high/low US\$2.54 US\$1.45

### Business description

Uranium Energy Corp is engaged in uranium mining and related activities, including exploration, development, extraction and processing of uranium concentrates, on projects located in the United States and Paraguay.

### Catalysts/next events

Resource delineation of Burke Hollow project	Q114
Permit submissions for Burke Hollow ISL project	Q114

### Analysts

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Andrey Litvin	+44 (0)20 3077 5755

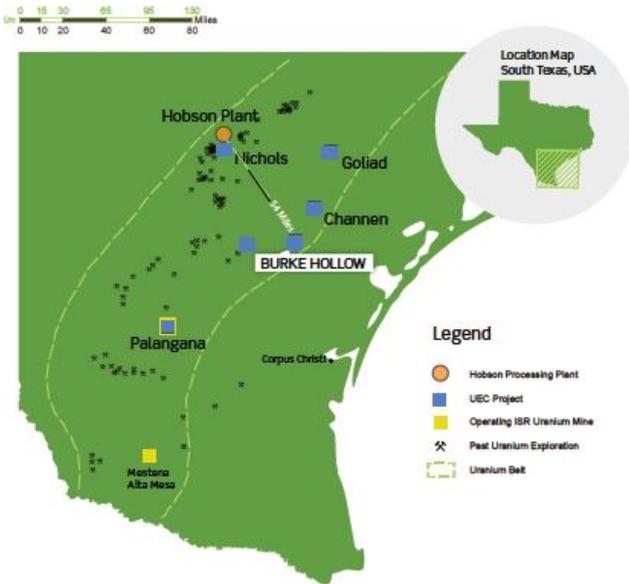
[mining@edisongroup.com](mailto:mining@edisongroup.com)

**Exhibit 1: Compliant resources**

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (U <sub>3</sub> O <sub>8</sub> )	Mlb (U <sub>3</sub> O <sub>8</sub> )
Palangana	100%	0.01	0.16%	0.022	0.4	0.13%	1.0	0.3	0.18%	1.2
Goliad	100%	1.5	0.05%	2.7	1.9	0.05%	2.8	1.4	0.05%	1.5
Burke Hollow	100%	--	--	--	--	--	--	2.7	0.05%	2.9
Salvo	100%	--	--	--	--	--	--	1.0	0.09%	2.8
Nichols	100%	--	--	--	--	--	--	0.8	0.07%	1.3
Anderson (OP&UG)	100%	--	--	--	26.8	0.03%	17.2	13.0	0.04%	12.0
Workman Creek	100%	--	--	--	--	--	--	2.9	0.09%	5.5
Yuty	100%	2.1	0.06%	2.8	5.8	0.05%	6.1	2.1	0.05%	2.2
Slick Rock	100%	--	--	--	--	--	--	0.7	0.30%	4.6
<b>Total attributable</b>	<b>100%</b>	<b>1.5</b>	<b>--</b>	<b>5.5</b>	<b>2.3</b>	<b>--</b>	<b>27.1</b>	<b>25.0</b>	<b>--</b>	<b>34.0</b>

Source: Company reports

**Exhibit 2: Location of UEC assets in Texas**



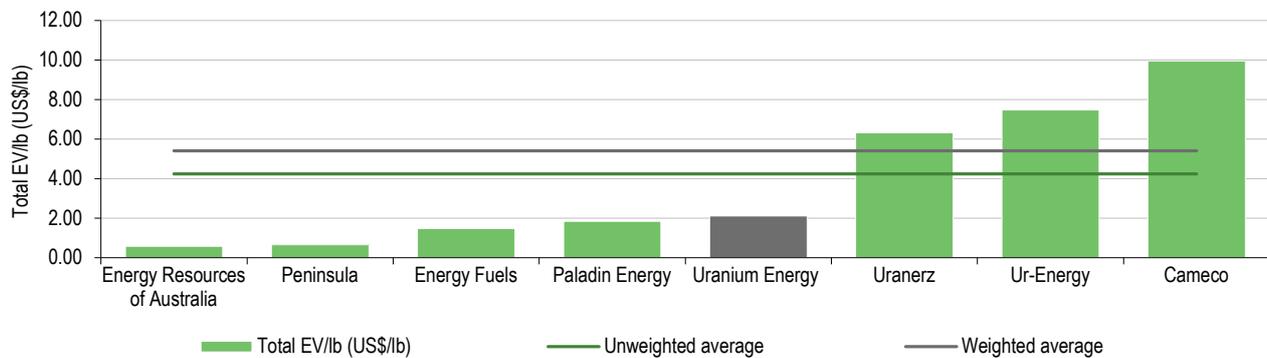
Source: Company reports

**Exhibit 3: Location of UEC's Paraguay assets**



Source: Company reports

**Exhibit 4: EV/resource valuation of the selected uranium producers (US\$/lb)**



Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

# Ur-Energy

## New kid on the block

Ur-Energy (URE) is the world's newest uranium producer as it continues to ramp up output at its Lost Creek project in Wyoming. On 23 December 2013, the company announced completion of its first sale of yellowcake. The new facility is an in-situ recovery plant with a 2Mlb U<sub>3</sub>O<sub>8</sub> per annum capacity. We expect Ur-Energy to continue to benefit from production and resource expansion. Given its production capacity at the Lost Creek facility, Ur-Energy could become a visible player on the US domestic uranium market in the near term.

Year end	Revenue (C\$m)	PBT (C\$m)	EPS (C\$)	DPS (C\$)	P/E (x)	Yield (%)
12/12	0.0	(13.1)	(0.11)	0.0	N/A	N/A
12/13e	7.9	(9.6)	(0.08)	0.0	N/A	N/A
12/14e	49.3	15.9	0.11	0.0	14.5	N/A
12/15e	62.2	28.6	0.16	0.0	9.9	N/A

Source: Company data; Bloomberg consensus estimates (17/02/14)

## Ramping up production at Lost Creek

URE's wholly owned Lost Creek property comprises six contiguous project areas that contain 8.7Mlb in the measured and indicated resource categories and another 4.7Mlb in the inferred category (based on a 0.02% eU<sub>3</sub>O<sub>8</sub> cut-off). The company announced that, at the end of 2013, production had reached 2,700lbs of U<sub>3</sub>O<sub>8</sub> per day (equivalent to 985,000lbs per year) and had sold 90,000lbs of U<sub>3</sub>O<sub>8</sub> at an attractive average price of US\$63/lb. In addition, URE has recently completed the acquisition of Pathfinder Mines from AREVA. The transaction consisted of a cash payment of US\$6.6m and a royalty on future production (capped at US\$6.6m) from Pathfinder's Shirley Basin property depending on the uranium spot price. Ur-Energy is currently compiling all historical data in order to determine a compliant mineral resource estimate for the project. Management believes that the Shirley Basin property is a high-grade ISR-amenable deposit with similar characteristics to its nearby Lost Creek project.

## Challenges: Low uranium prices

Due to the oversupply caused by the Fukushima accident, we see depressed uranium pricing as the key challenge for the sector. However, given the gradually improving supply-demand balance, we believe that uranium prices have bottomed out and expect them to recover in the short-to-medium term. This should lead to improved sentiment in the sector.

## Outlook: De-risking in an uncertain market

Management expects URE to produce c 1Mlbs of U<sub>3</sub>O<sub>8</sub> in FY14, which would represent c 20% of total US production. Given the recent US\$34m funding arrangement with the Wyoming Industrial Development Revenue Board, UR-Energy should be sufficiently funded for continued production and updating the resources at its newly acquired Pathfinder Mines projects. More importantly, Ur-Energy has several long-term contracts valid through 2019 to support production plans at its Lost Creek project. This should help URE to weather the downturn.

25 February 2014

**Price** **C\$1.59**  
**Market cap** **C\$195m**

Net debt (C\$m) as at September 2013	26.2
Shares in issue	122.5m
Free float	97.3%
Code	URE
Primary exchange	TSX
Secondary exchange	NYSE

### Share price performance



52-week high/low C\$1.62 C\$0.76

### Business description

Ur-Energy is an emerging uranium producer operating the Lost Creek in-situ uranium processing facility in Wyoming. Ur-Energy engages in the identification, acquisition, exploration, development and operation of uranium projects in the United States and Canada.

### Next events

Q114 results and production update	May 2014
Resource upgrade at Shirley Basin and Lost MC	End-2014
Production ramp up	Ongoing

### Analysts

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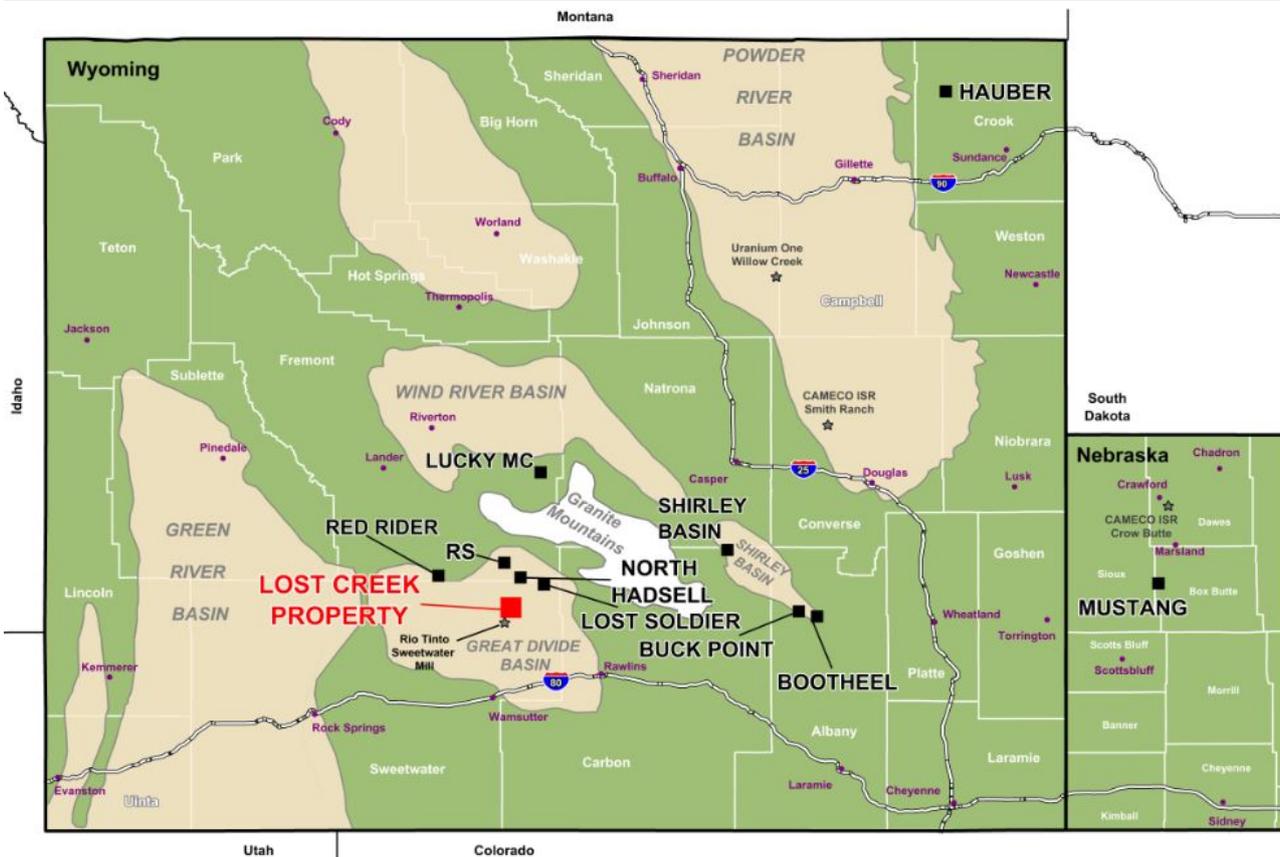
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**Exhibit 1: Compliant resources**

Deposit	Interest (%)	Measured			Indicated			Inferred		
		Tonnes (Mt)	Grade (wt%) (eU <sub>3</sub> O <sub>8</sub> )	Mlb (eU <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (eU <sub>3</sub> O <sub>8</sub> )	Mlb (eU <sub>3</sub> O <sub>8</sub> )	Tonnes (Mt)	Grade (wt%) (eU <sub>3</sub> O <sub>8</sub> )	Mlb (eU <sub>3</sub> O <sub>8</sub> )
Lost Creek	100%	2.8	0.06%	3.6	2.1	0.05%	2.4	1.7	0.06%	2.1
Lost Creek East	100%	1.1	0.05%	1.3	1.5	0.04%	1.4	1.5	0.05%	1.5
Lost Creek North	100%	--	--	--	--	--	--	0.4	0.05%	0.5
Lost Creek South	100%	--	--	--	--	--	--	0.6	0.04%	0.6
Lost Creek West	100%	--	--	--	--	--	--	0.0	0.11%	0.04
Lost Soldier	100%	3.5	0.06%	5.0	5.0	0.07%	7.2	1.5	0.06%	1.8
<b>Total Attributable</b>		<b>7.4</b>		<b>9.9</b>	<b>8.7</b>		<b>10.9</b>	<b>5.7</b>		<b>6.5</b>

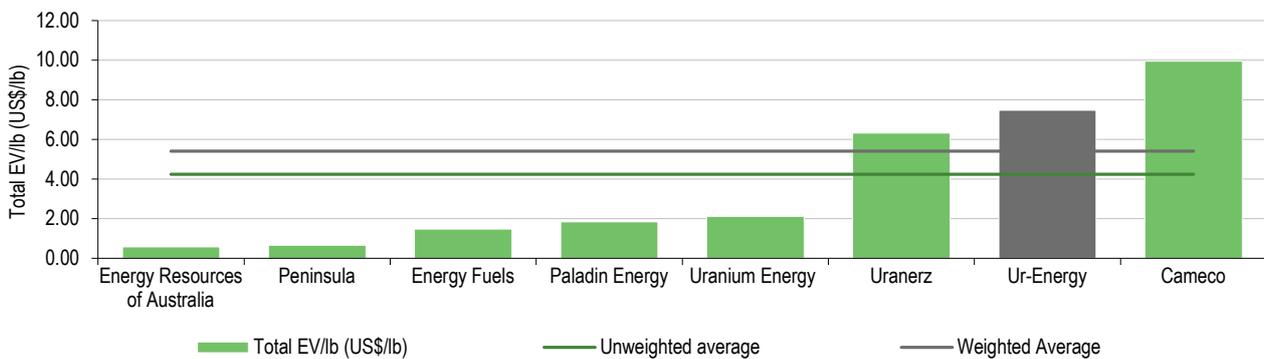
Source: Company reports

**Exhibit 2: Location of Ur-Energy's Lost Creek property and other assets.**



Source: Company reports

**Exhibit 3: EV/resource peer comparison for the selected producing companies**



Source: Company reports, Edison Investment Research. Note: Prices as at 17 February 2014.

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