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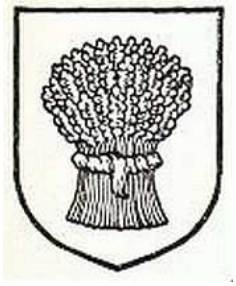

HALLGARTEN & COMPANY

Thinkpiece

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Uranium in Argentina

The Logic of Vertical Integration

Company	Ticker	Currency	Price	Mkt Cap mn	Stage	Call
Crosshair Uranium	CXX.to	CAD	0.025	1.64	Exploration	N/A
Blue Sky Uranium	BSK.v	CAD	0.05	1.11	Exploration	N/A
U3O8	UWE.v	CAD	0.130	20.88	Advanced Exploration	N/A
Cauldron Energy	CXU.ax	AUD	0.10	15.96	Exploration	N/A

Uranium in Argentina

The Logic of Vertical Integration

- + The country has an aggressive nuclear expansion campaign, from an existing base of several reactors
- + Public opposition to nuclear power is almost non-existent and the country has an energy shortage
- + At least at first glance most U-mining could be done open-pit, which is cheaper but open-pit mining has gleaned opposition in the past in other metals in Argentina
- + Greens are small in number in Argentina and distant from the locations where uranium might be mined
- + A turnover in the political sphere could lower labour and other mining costs from their current high level
- × Argentina is moving closer to one of its periodic cathartic moments with the lifespan of the current Administration counted in months, if not weeks
- × Uranium's spot price remains in the doldrums but more disturbingly the contract price, which is the real indicator, has retreated over the last year
- × A mine owned by the government has encountered opposition from some quarters but government has not really pushed the issue

Ahead of the Pack (as usual)

When we say Argentina is a nuclear power we are not referring to the club of those armed with bombs but rather the similarly small group of countries that generate electricity from nuclear power. Moreover unlike many of those in retreat from an activity they hate to need, Argentina without any fanfare is adding a third reactor to its existing two reactors.. But then again as "we all know" Argentina is not as good as Brazil or Chile. There we would beg to differ. Frankly, once again Argentina shows it has the best infrastructure in Latin America. That the legacy of past investment is badly managed and frequently neglected is undoubted but the country has been ahead of the pack since the 1920s, got an overhaul in the 1990s and has spent most of the last ten years backsliding (except in nuclear).

Argentina has also been active in nuclear power generation & research and uranium mining since the middle of last century. Some 10% of current electricity needs are met from nuclear power stations in the country. The Comisión Nacional de Energía Atómica (CNEA - Atomic Energy Commission) was set up in 1950 to oversee nuclear R&D, including construction of several research reactors. Currently, five research reactors are operated by CNEA and others. Another is planned, similar to the Opal reactor built in Australia by Argentina's INVAP. An example of the country's membership of the front ranks of nuclear technology nations is that Argentina's CAREM small modular reactor design is under consideration for massive desalination projects in Saudi Arabia.

The Power Program

The goal of Argentine's currently (ostensibly) left-leaning government is for nuclear power to be part of an expansion in generating capacity to meet rising demand. The government has signed co-operation agreements with China and UAE and Argentina and just received a $240m loan from the development bank of Latin America to extend the life of an existing reactor- this supports Argentina's push to grow its nuclear capacity.

Currently two nuclear reactors generate nearly 10% of the country's electricity and a third reactor is expected to begin operating in mid-2013. The backstory to these is that in 1964, the focus shifted to nuclear power, and following a feasibility study for a 300-500 MW unit for the Buenos Aires region, bids were invited. With the country's policy firmly based on using heavy water reactors fuelled by natural uranium, Canadian and German offers for heavy water designs were most attractive, and the offer from Kraftwerk Union was accepted. The 100% financing that came with the deal was a major attraction for the Argentine authorities.

That plant, known as Atucha 1 was built at Lima, 115 km northwest of Buenos Aires, and entered commercial operation in 1974. It has a pressure vessel, unlike any other extant heavy water reactor, and it now uses slightly enriched (0.85%) uranium fuel which has doubled the burn-up and consequently reduced operating costs by 40%.

In 1967, a second feasibility study was undertaken for a larger plant at Embalse in the Córdoba region, 500 km inland. In this case a CANDU-6 reactor from Atomic Energy of Canada Ltd (AECL) was selected, partly due to the accompanying technology transfer agreement, and was constructed with the Italian company, Italimpianti. The Embalse plant entered commercial operation in 1984, running on natural uranium fuel. In 2010, an agreement was signed to refurbish the plant to extend its operating life by 25 years and increase its power output by around 7%. It is currently running at about 80% capacity to limit neutron damage to pressure tubes.

The Stalled Next Leg

In 1979, a third plant – Atucha 2 – was ordered following a government decision to have four more units coming into operation in the period 1987-97. It was a Siemens design, a larger version of unit 1, and construction started in 1981 by a joint venture of CNEA and Siemens-KWU. However, work proceeded slowly due to lack of funds and was suspended in 1994 when the plant was 81% complete. Interestingly this coincided with the years in which the Menem administration was most vigorously privatizing electricity assets. To our memory we cannot remember the nuclear plants ever being proposed for sale. Certainly mothballing the new nuclear plant would have been good news for the newly minted owners of the thermal generators that the government had just sold.

In 1994, Nucleoeléctrica Argentina SA (NASA) was set up to take over the nuclear power plants from CNEA and oversee construction of Atucha 2.

The Siemens design of the Atucha PHWR units is unique to Argentina, and NASA was seeking expertise

from Germany, Spain and Brazil to complete the unit. In 2003, plans for completing the 692 MW Atucha 2 reactor (745 MW gross) were presented to the government. Completing Atucha 2 by 2010 was expected to cost US$ 600 million, including $400 million for heavy water. Effective completion of Atucha 2 construction was in September 2011. The Neuquen heavy water plant completed production of 600 tonnes of heavy water in June 2012, and this was expected to be loaded around April 2013, after loading the 9.76 metre-long fuel assemblies, which commenced in December 2012. Start-up was scheduled for June 2013.

And Further Expansion?

As mentioned earlier, in August 2006, the government announced a US$3.5 billion strategic plan for the country's nuclear power sector. This involved completing Atucha 2 and extending the operating lifetimes of Atucha 1 and Embalse. The life of the Embalse CANDU-6 type plant will be extended by 25-30 years in partnership with Candu Energy Inc. This latter firm is a subsidiary of SNC-Lavalin Group which took over Atomic Energy of Canada Ltd reactor division in 2011.

Embalse's power output will be increased by about 35 MW under the latest plan. Contracts for $440 million were signed in August 2011, the main work will commence in November 2013, and the reactor is due to be offline for about 20 months then, though the whole project will take five years. Total cost is put at $1.37 billion.

A feasibility study on a fourth reactor has been undertaken, originally planned to start construction after 2010 with a US$2bn capex projected. In July 2007, NASA signed an agreement with AECL to establish contract and project terms for construction of a 740 MWe gross Enhanced CANDU 6 reactor, as well as completing Atucha 2. A further 740 MWe Enhanced CANDU 6 unit was proposed. However, the government has been talking also with reactor vendors from France, Russia, Japan, South Korea, China and the USA, indicating that its fourth and fifth reactors are more likely to be LWR type, with Atucha the most likely location. Russia is planning to offer two AES-2006 units, and China is offering 1000 MWe units. Areva claims that its Atmea1 reactor is pre-qualified by NASA. A final decision on Atucha 3 & 4 is pending Atucha-2 completion and the mooted refurbishing of Embalse. In October 2012 the government said that Areva, China National Nuclear Corporation (CNNC), Kepco, Rosatom and Westinghouse were pre-qualified for tendering in 2013.

Scientific Development and Cooperation

In February 2010, the government signed an agreement with Russia's Rosatom to share technical information related to the construction of nuclear power plants and look at possibly using Russian technology in the country. In April 2010, a nuclear cooperation agreement was signed with Russia, and in September 2010, another was signed with South Korea. In May 2011 Rosatom and the Argentine planning & investments minister said they were discussing the possibility of joint development and construction of a 640 MWe reactor of unspecified type. In June 2012 the government signed a nuclear cooperation agreement with China, involving studies for a fourth nuclear power plant, financed by China, and a transfer of fuel fabrication and other technology. The government said that it could open the way for the CNEA to be involved in building new plants.

Mention should be made of the CAREM-25 nuclear reactor, which has been developed by CNEA with INVAP and others, since 1984. It is a modular 100 MWt simplified pressurised water reactor with integral steam generators, designed to be used for electricity generation (27 MWe gross, 25 MWe net) or as a research reactor or for water desalination. As mentioned earlier, a CAREM plant is under consideration for desalination in Saudi Arabia.

CAREM has its entire primary coolant system within the reactor pressure vessel, self-pressurised and relying entirely on convection. Fuel is standard 3.4% enriched PWR fuel, with burnable poison (a neutron absorber that is incorporated in the fuel or fuel cladding of a nuclear reactor and gradually burns), and it is refuelled annually. The prototype will be followed by a larger version, possibly 200 MWe, in the northwestern province of Formosa by 2021. Recent studies have explored scaling it up to 300 MWe.

Another aspect of the 2006 plan was to build a 27 MWe prototype of the CAREM reactor, and this is now at pre-construction stage, next to Atucha, for completion at the end of 2016. Civil works next to the Atucha site were to start in 2012, the electromechanical installation was due in the first half of 2013 and fuel loading then grid connection in 2016. This schedule appears unlikely. Some 70% of components were slated to be of local manufacture.

INVAP has built several research reactors for CNEA and international customers in Egypt (ETRR-2), Algeria (NUR), Peru (RP-0 & RP-10) and Australia (OPAL). Its first was RA-6, a 0.5 MWt open-pool multi-purpose research reactor designed by CNEA and inaugurated in 1982. It is located in San Carlos de Bariloche, Rio Negro, on the premises of the Centro Atómico Bariloche (CAB) belonging to CNEA. It is principally for training, and uses 20%-enriched fuel. RA-8 followed it and operated 1997-2001 in Pilcaniyeu, Río Negro, testing fuel enriched up to 3.4% and control rods for CAREM. It was an open-pool zero power unit.

All this goes to show that Argentina is not just a technology taker in this very sophisticated area but an innovator as well. Indeed the club of those with nuclear industrial capacity is very small indeed. The glaring absence at this point is a primary mine to source material.

Legal Framework

In 1994, the Nuclear Regulatory Authority (Autoridad Regulatoria Nuclear, ARN) was formed and took over all regulatory functions from the National Board on Nuclear Regulation (Ente Nacional Regulador Nuclear, ENREN) and CNEA. As well as radiation protection, it is responsible for safety, licensing and safeguards. It reports to the President.

It is useful we feel to go over what types of regulations cover this industry in Argentina.

Art. 205. – The nuclear minerals are regulated for this law as first and second class mines. The Atomic Energy Commission (CNEA) is in charge of the supervision and the provision of advice to provinces about uranium exploration and production.
Art. 206. – Uranium and Thorium are nuclear minerals
Art. 207. – The companies that exploit nuclear mines need to elaborate an EIA before any action. It iss forbidden to sell or export nuclear product without CNEA and Government authorization.

Art. 208. – The owners of mines with nuclear minerals are required to inform the CNEA of reserves and production of these facilities
Art. 209. – CNEA will have the first option to sell the nuclear minerals
Art. 210. – The export of nuclear minerals and derivatives needs the CNEA approval, which shall guarantee the internal provision and final destination of the exported minerals
Art. 211. – CNEA may prospect, explore and produce concentrates of nuclear materials in accord with this law. CNEA will exploit or maintain in reserve of following mines: Doctor Baulies/Los Reyunos (in Mendoza Province) and Cerro Solo (in Chubut Province).

The Rest of the Argentine Nuclear/Industrial Complex

Having a domestic nuclear energy industry has also brought Argentina industrial spin-offs in the creation of various plants and technologies that otherwise the country would have no need for. In reviewing these ancillary services, it is glaringly apparent that the missing component is an actual mine capability. Amongst the industrial facilities is a 150 tpa mill complex and refinery producing uranium dioxide powder operated by Dioxitek, a CNEA subsidiary, which is located at Córdoba.

CNEA has a small enrichment plant at Pilcaniyeu, near Bariloche, Rio Negro province, with 60 t/yr capacity. Over 1983-89, INVAP operated a small (20,000 SWU/yr) diffusion enrichment plant for CNEA at Pilcaniyeu but this proved to be unreliable and produced very little low-enriched uranium. After this plant was mothballed enrichment services were imported from the USA.

In August 2006, the CNEA announced that it wanted to recommission the enrichment plant, using its own Sigma advanced diffusion enrichment technology which it claimed to be competitive. The principal reason given was to keep Argentina within the circle of countries recognised as having the right to operate enrichment plants, and thereby support INVAP's commercial prospects internationally. It was proposed to restart enrichment on a pilot scale in 2007 and work up to 3 million SWU/yr in three years. In 2010 the Argentine President inaugurated the recommissioning of the plant.

Production of fuel cladding is undertaken by CNEA subsidiaries. Fuel assemblies are supplied by CONAUR SA, also a CNEA subsidiary, located at the Ezeiza Centre near Buenos Aires. The fuel fabrication plant has a capacity of 150 tpa for Atucha-type fuel and Candu fuel bundles.

Heavy water is produced by ENSI SE (Empresa Neuquina de Servicios de Ingeniería), which is jointly owned by CNEA and the Province of Neuquén where the 200 tpa plant is located (at Arroyito). It is operated by Neuquen Engineering services, majority owned by the provincial government. This was rebuilt and scaled to produce enough for Atucha 2 and the three following reactors at a cost of about $1 billion, and so now has capacity for export.

There are no plans currently for reprocessing used fuel, though an experimental facility was operated in the early 1970s at Ezeiza.

Radioactive waste management

Under the guiding legislation for the sector, the National Law of Nuclear Activity passed into law in April

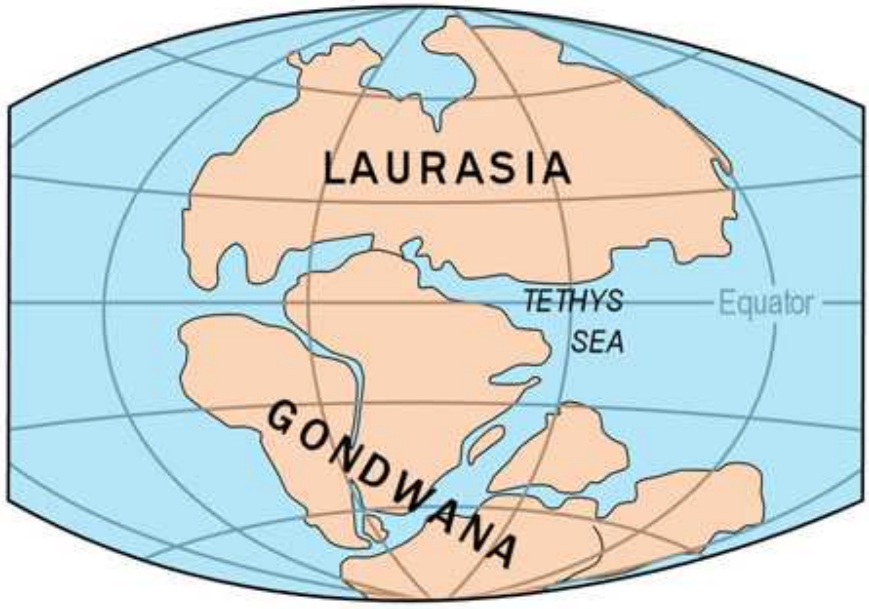
1997 the law assigns responsibility to CNEA for radioactive waste management, and creates a special fund for the purpose. The operating plants pay into this fund, even though they, like the CNEA, are owned by the government anyway.

Those wastes of low and intermediate-levels, including used fuel from research reactors, are handled at CNEA's Ezeiza facility. Used fuel is stored at each power plant. There is some dry storage at Embalse.

The CNEA is also responsible for plant decommissioning, which must be funded progressively by each operating plant, though as yet no plant has been decommissioned and one wonders how much money would really have been squirrelled away for this purpose in light of the past and present Argentine governments' propensity to raid the piggybank for ongoing budgetary needs (not to mention the regular wipe-outs for currency value from inflationary outbursts).

The Geological Perspective

The attractiveness of Argentina for uranium exploration has much to do with the historical background. By historical we are not talking recently but rather across the eons, in fact back to the break-up of Gondwanaland. In this process of continental drift the current continents of South America and Africa parted company, with Argentina being sheared off from Namibia. The state of Gondwanaland some 200 million years ago is shown in the map below.



Namibia was long famous for its diamonds but is now better known for its uranium deposits and it is with this geological history as a foundation that experts have posited that Argentina, particularly Patagonia, might share the uranium wealth that Namibia does.

Uranium Deposits

Argentine uranium resources listed in the International Atomic Energy Agencies' Red Book total only about 15,000 tonnes of U_3O_8, though the CNEA estimates that there is some 55,000 tonnes as "exploration targets" in several different geological environments. Uranium exploration and limited mining was carried out from the mid-1950s, but the last mine closed in 1997 for economic reasons. Cumulative national production until then from open pit and heap leaching at seven mines was 2,509 tU.

However, talk has circulated in recent years about reopening the CNEA's Sierra Pintada mine (also known as the San Rafael mine and mill) in Mendoza in the central west, which closed in 1997. Reserves there and at Cerro Solo in the south total less than 8,000 tU. A resumption of uranium mining was part of the 2006 plan, in order to make the country self-sufficient.

The San Rafael Mine and mill is shown in the photograph above. The complex consists of:

- Open pit with 0.025%U cut off.
- 6,500 tU reserves.
- Stripping ratio 10/1.
- Average uranium grade: 0.076%.
- Bench height: 2.5m.
- 13.4 million m^3 of tailings
- 376,000 tonnes marginal mineral
- 2,500,000 tonnes of mill feed

There is also the unmined Cerro Solo deposit, likewise owned by the CNEA and located 15 km south of Bororo Nuevo and is reported to contain a historical resource estimate of 15.4 million pounds of U_3O_8.

Both Sierra Pintada and Cerro Solo projects face difficulties related to obtaining permits. Waste remediation is being carried out, or is under study, at former mining/milling sites. The efficient completion of remediation will be very important for obtaining social licenses for new production, as the

social perspective on nuclear and mining activities is as controversial in Argentina as in other countries.

The Don Otto uranium mine is located in Salta in the far north of the country, and was the largest mine operated to date in that area, reportedly (Romano, 1999) produced approximately 479,000 t of 0.084% uranium between 1963 and 1981, although this total may include production from the nearby Los Berthos Mine and possibly the Emmy Mine. Published government resource figures for the Tonco district (Romano, 1999) total 15.9 million tonnes at 0.035% U containing 5,630 t of uranium (0.01% U cutoff). In 2007, CNEA reached agreement with the provincial government of Salta to reopen the Don Otto uranium mine. At that time block leaching was envisaged as the extraction method. In postings at Wealth Minerals' website they claim the old mine is "completely encompassed" by their concession. More correct wording would be "surrounded by" to dispel the impression that the mine is on their claim. In any case, Wealth no longer own either.

The Foreign Players

Uranium explorers have come and gone in Argentina but that is less a reflection on the prospectivity or even Argentina than on the fate of Uranium prices in recent years which have been buffeted by ill-fortune on a regular basis.

One thing we noted many moons ago was that if a company like Wealth Minerals (WML.v) could turn up in Argentina and in relativity short order have 11 deposits under its belt then prospectivity was certainly not in doubt. Wealth however headed off in pursuit of the shiny object of Rare Earths and has let its Argentine lead in Uranium exploration be eroded. The dalliance with REEs didn't last long and then they decamped to Mexico to hunt for silver. They are nothing if not "market-responsive".

The four players that we can see still active (and we use that word with generosity) are Blue Sky Uranium, Crosshair and U3O8. We also give an honorable mention to the ASX-listed Cauldron Energy.

Crosshair Energy (NYSE MKT: CXZ - TSX: CXX)

The departure of the aforementioned Wealth Minerals (WML.v) from Argentina (or at least in uranium – for it had dabbled in Rare Earths also) saw the entrance of Crosshair, a company that we had previously encountered in the wilds of Newfoundland.

In late October 2012, Crosshair announced that it had signed a Letter of Intent with Wealth Minerals to acquire all its prospective uranium properties in Argentina. The properties include the San Jorge Basin Properties, Amblayo and Diamante Los Patos.

This land package totals more than 2,600 square miles located in Salta, Catamarca and Chubut provinces, and will be 100% owned by Crosshair on the closing of the transaction. The consideration for the acquisition of the properties is payments to Wealth Minerals of CAD$1 million in cash and issuances to Wealth Minerals of one million Crosshair common shares. The cash payments and share issuances will be done over a two year period. In addition, Wealth Minerals retains a 1% yellowcake royalty on all uranium production and a 1% NSR royalty on all other minerals.

The San Jorge Basin concession area includes five individual properties (including Bororo Nuevo) on which some preliminary exploration work has been completed.

The Bororo Nuevo property covers an area of 35,500 hectares (137 square miles) within the historically productive San Jorge Basin and is the most advanced of the uranium properties being acquired. To date, nine zones of mineralization have been discovered within an area that measures 12 kilometres by 4 kilometres, with less than 12% of the property having been mapped and prospected. Other exploration companies currently active in the basin include U3O8 Corp. (discussed further along) and the privately-owned UrAmerica Ltd.

The San Jorge Basin is host to two past-producing deposits: Los Adobes and Cerro Condor. The Cerro Solo deposit, mentioned earlier as owned by the National Commission of Atomic Energy (CNEA) is located 15 km south of Bororo Nuevo.

The Amblayo property totals 14,998 hectares (58 square miles) and is located in the core of Argentina's Tonco uranium district. The property completely surrounds the past-producing Don Otto mine, which operated intermittently from 1963 to 1981. As noted earlier the Don Otto mine itself was not included in the concessions being acquired from Wealth Minerals.

The Diamante Los Patos property represents the discovery of a large, new area of uranium mineralization located on the boundary between the provinces of Salta and Catamarca in northwestern Argentina. Exploration on the 13,300 hectare (51 square mile) property has identified seven large mineralized zones over a 20 kilometre by 30 kilometre area.

Crosshair has had less than ideal relations with one of the holders of some of the territory on which its flagship Bootheel property in the Wyoming lies. This prompted the company to recently step back from further work there (despite having already produced a resource, albeit small) which must augur well for other properties in its portfolio that have received less attention. The company is also in the process of

retreating from its NYSE listing, which is quite an indictment of that market and its attractions. However, with its current skinny market cap at the current time, we might venture that Crosshair was the lowest capitalized stock on that market. The refocus may bode well for increased focus on Argentina.

Blue Sky Uranium (BSK.v)

It's quite a few years since we last met Blue Sky Uranium and they deserve credit for having stuck to this tough path with the double burden of weak uranium sentiment and largely negative sentiment towards Argentine mining projects. BSK is a uranium exploration company with more than 5,000 km2 (500,000 ha) of tenements. Its mission is to acquire, explore, and advance a portfolio of uranium projects with an emphasis on surficial deposits, and management is focused on advancing its new uranium discoveries.

The last time we wrote about a company in the Grosso Group was about IMA Exploration which was reduced to a cash-shell through its most unfortunate loss of the La Navidad property to Aquiline (after which Aquiline was taken over for US$626 million by Pan-American Silver). We mention this in passing as Blue Sky is a member of the Grosso Group, a management company specializing in Argentina since 1993 and headed by Joe Grosso, Argentine-born and a sometime Prospector of the Year. As a member company, Blue Sky benefits from the signing of an agreement in principle for a strategic alliance with the Government of the Rio Negro province, Argentina, for the purpose of jointly exploring the potential for commercial mining activity.

The most interesting thing about Blue Sky is that it appears to be AREVA's anointed partner in Argentina. In January 2012, BSK announced that the company had entered into a Memorandum of Understanding with the French uranium giant, AREVA Mines, to jointly explore Argentina for uranium deposits. The MOU Terms (all dollar amounts in CAD) were:

- AREVA and Blue Sky form a joint technical committee to direct exploration activities
- Blue Sky will be the operator in years one and two (2012 and 2013)
- AREVA can select one or two projects and earn 51% interest by:
    - Funding $1 million in exploration in year one.
    - Funding $2 million in exploration in year two.
    - Funding $3 million in year three on the project AREVA selects if only one project is selected, or funding a total of $4 million in exploration on two projects if AREVA selects two projects.
- At the end of year two, Blue Sky will retain a 100% interest in all projects except the one (or two) project(s) AREVA selects to earn a 51% interest.
- On newly acquired uranium targets in Argentina that are not listed in this MOU, AREVA can elect to earn a 51% interest by funding $1 million in exploration on each new target
- For any non-uranium discoveries made Blue Sky will retain a 100% interest

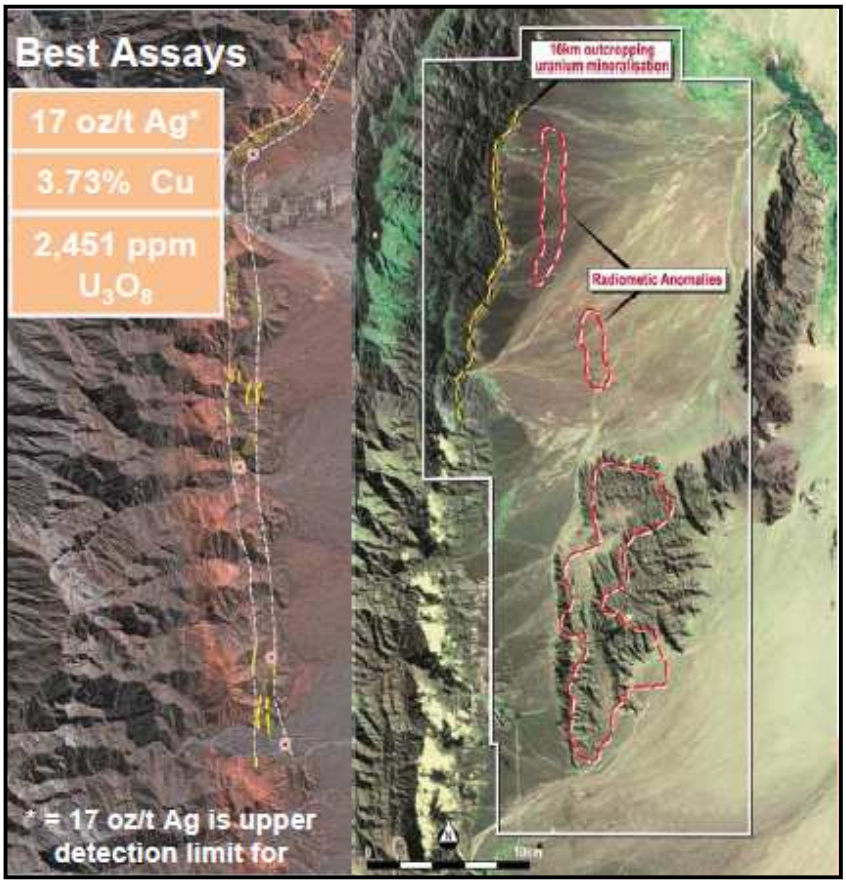
The focus of exploration is within the San Jorge Basin of Rio Negro Province where Blue Sky is working on its Anit, Ivana and Santa Barbara projects and is permitting several new targets within the region to develop the district wide potential. The region is flat lying, located at an elevation of approximately 200 metres, has an annual rainfall of less than 300 mm, semi-arid environment, very low population density, and allows round exploration via well maintained gravel road access.

BSK has completed more than 23,000 km^2 of radiometric and magnetic survey, the first of survey of its kind ever conducted in the region. This has resulted in the discovery several large new mineralized systems that are associated with the radiometric anomalies. Surface follow-up by Blue Sky of the Santa Barbara and ANIT systems has discovered abundant uranium-bearing petrified wood and visible yellow uranium mineralization on and near surface.

Just because the Grosso Group had a misstep in Argentina on a previous occasion does not mean that it need happen again. If anything, it should be more careful next time. In any case the assets this time are not in contention. Joe Grosso certainly knows how to move and shake in Argentina and that might put him in pole position when it comes to swinging the national government behind a vertical integration story.

Cauldron Energy (CXU.ax)

This ASX-listed company is the product of the merger between Scimitar Resources Limited and Jackson Minerals Limited - two Australian exploration juniors with complementary exploration profiles. It is currently in the throes of bidding for another ASX junior, Energia Metals. Cauldron now controls a suite of uranium projects that are diversified in terms of stage of development and location between Australia and Italy. This takeover and the malaise in uranium prices (not to mention Argentina again being in the doghouse) have resulted in the focus being elsewhere at this time for Cauldron. However, its Argentine assets, Rio Colorado (Uranium-Copper-Silver) and Las Marias (Uranium only), are interesting so definitely should not be overlooked.



The Rio Colorado project is located in the Tinogasta region of the Catamarca and La Rioja provinces in Argentina. It covers an area of 762 km2 with a substantial deposit outcropping for 16km, containing numerous small scale workings completed by the CNEA in the 1950's and 1960's.

The 16 km zone of intermittently outcropping mineralised sediments has widths of between 10 to 20 metres in one zone. Where sampled, these sediments include better zones of between 300 and 3,000 ppm U3O8 over widths of up to 10.7 metres. Adjacent to these high-grade areas the background anomalism averages 90 ppm U3O8. Due diligence sampling by Jackson Minerals produced results up to 2,451 ppm U3O8 (5.4 lbs/t U3O8) which support historical selective bulk sampling (2,900 ppm U3O8) documented by the CNEA.

Meanwhile the copper and silver mineralisation has a similar spatial distribution to the uranium, but is focused into narrower bed parallel zones. This would signal to us a lead exciting base metal component. The issue then is whether these base metals bring by-product credits or just complicate the metallurgy.

Cauldron's aim with the Stage 1 exploration target is to satisfy Argentina's current "life-of-reactor" uranium requirements of 7,500t U_3O_8. An ambitious goal indeed.

It should be noted that La Rioja is now very pro-mining province but only a couple of years ago was diametrically opposed to mining until a flipflop occurred in the politicians in power. Frankly we had been dubious during the "ban-period" that there was actually any real political opposition, instead it was just a matter of internal faction fighting in the Peronist Party in the province.

The Las Marias project is also claimed to be prospective by the company with a 7 km unit of outcropping uranium rich sandstones, including visible uranium oxide minerals, has been identified using hand-held geophysical equipment. Scintillometre readings of the leached surface material indicate a range typically between 100 to 550 ppme U_3O_8, with a maximum reading of 1,300 ppme U_3O_8.

This project was explored by the Atomic Energy Commission of Argentina (CNEA) in the 1970's. Priority exploration targets exist under cover, along extensions of the outcropping mineralisation. According to the company the project is currently under application, with the first exploration lease expected to be granted early in 2013, but we have seen no confirmation that this occurred.

We are not sure how to measure the seriousness of this company. These ASX players can run very hot and cold and they mix up projects in disparate continents, flipping back and forward depending upon the fashion of the market. At the moment the Argentine uranium assets do not even appear to be on the company's "to do" list.

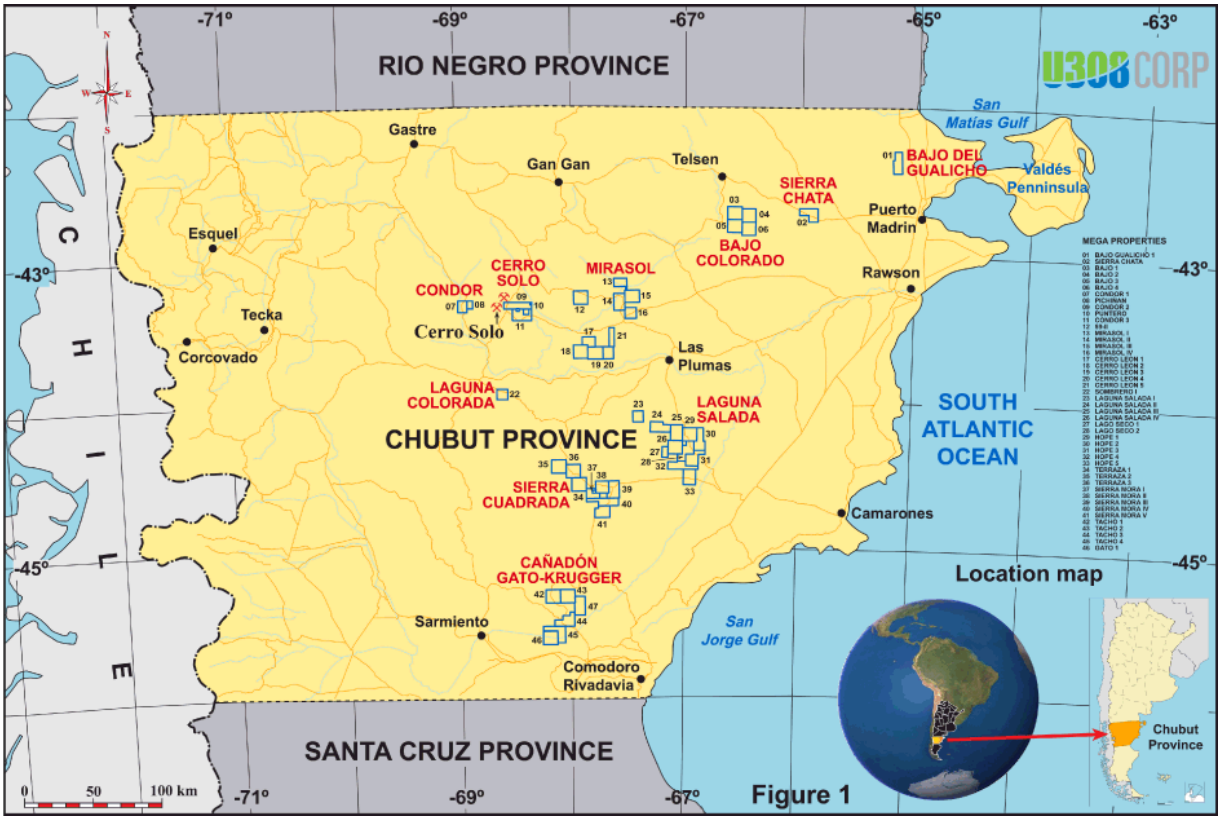
U308

While the company's uranium deposit in Colombia had it running off in that fashionable direction, we were always more well-inclined towards their Argentine assets. These assets had their genesis in Mega Uranium (MGA.to), which divested the assets to U3O8 when Mega narrowed down its focus several years ago.

The most advanced of these Argentine projects is the Laguna Salada Project in Chubut Province, which is a surficial uranium-vanadium deposit on which an NI43-101 resource statement was pre[ared by Coffey Mining in May of 2011. This report estimated a resource of:

- NI 43-101 uranium resource of 6.3 mn lb at 60 ppm U_3O_8 (Indicated) and 3.8 mn lb at 85 ppm U3O8 (Inferred)
- NI 43-101 vanadium resource of 57mlb at 550 ppm V_2O_5 (Indicated) and 27 mn lb at 590 ppm V_2O_5 (Inferred)

A positive feature is that mineralization occurs within three metres from surface in soft, unconsolidated gravel that should be amenable to low-cost mining techniques with no blasting and crushing required. Even better, simple screening separation of the pebbles and coarse sand concentrates the uranium-vanadium in the fine material and increases uranium and vanadium grades between three and 11x. For uranium, this would lead to a head grade of approximately 620-670 ppm – similar to head grades of operating surficial deposits elsewhere in the world. Thirdly, most of the fine metal-rich material in the Guanaco area, which constitutes 90% of the Laguna Salada deposit, can be leached quickly with alkaline reagents achieving maximum uranium recoveries in only four hours.



In the Guanaco area of the Laguna Salada deposit, alkaline leaching resulted in recoveries of 94% uranium and 51% vanadium from the screened fines after four hours of leaching. In contrast, acid leach was very effective on material from the Lago Seco area and showed recoveries of 96% for uranium and 71% for vanadium after 36 hours of leaching. Metallurgical testing are ongoing to optimize the recovery and beneficiation results that the company has achieved to date.

Summary Results from the Screen Samples at Laguna Salada

Sector of the Laguna Salada deposit	Uranium Grade			Vanadium Grade			Percentage of fines (finer than 0.1mm in raw gravel)
	U_3O_8 grade in raw gravel (ppm)	U_3O_8 grade in screened fines (ppm)	Upgrade factor for Uranium in screened fines	V_2O_5 grade in raw gravel (ppm)	V_2O_5 grade in screened fines (ppm)	Upgrade factor for Vanadium in screened fines	
Guanaco	55	623	11.4X	349	1,893	5.4X	8%
Lago Seco	161	668	4.1X	416	1,202	2.9X	23.3%

There is a PEA is underway on the Argentine deposit which is due out most likely in mid-2013.

The fly in the ointment for U3O8 is that there is presently an open-pit mining ban in Chubut Province. Some draft legislation is supposedly doing the rounds, which proposes that open-pit mining be allowed in the central semi-desert plain of the province. A similar approach, that allows mining in the central plain, is in effect in the adjacent Santa Cruz Province. Laguna Salada and several other mining projects are situated in this central plain of Chubut Province including interestingly the CNEA's Cerro Solo uranium deposit, which we mentioned earlier, and Pan American Silver's Navidad silver project, both of which are reported to be due for development by open-pit mining methods. The Navidad project however was halted in December of 2012 due to PAAS's objections to a new tax regime in the province rather than the open-pit mining regulations. We would note that the province very well cannot approve the CNEA going ahead with an open-pit project while blocking U3O8 from moving forward.

The company feels that the positive developments in the expansion of the nuclear power plant fleet in Argentina play well into its hopes for its uranium deposit in Argentina, which could be simple and easy to move into production within a relatively short timeframe. The company does however, to mix a metaphor, seem to be counting its ducks before they have got in a row. It claims that, with its Argentine deposit, it has a "nicely sequenced approach" where U3O8 could move firstly its Argentine deposit towards production (ideally with a partner like Cameco who is active in the region) while it develops the Colombian deposit which is larger-scale, but also with a very low cost uranium production profile. U3O8 published a positive PEA earlier this year on its Colombian deposit, which shows revenue from by-products could pay for extracting the uranium.

U3O8 are by far the most advanced and most serious group playing the Argentine radioactive minerals sandbox. This has been a long and lonely row to hoe but the presentation of a realistic plan to the Argentine government on possible production that will be both import replacing and free the country from outside pressures (the evermore interventionist US, for example) could be just the right balance to give a mine build CNEA approval. This would make the acquisition of U3O8 by a major into a logical, derisked transaction for the major.

Uranium Explorers – Exit Strategies

While the Canadian mining market is riddled with companies that are not serious about getting to production, we have noted that the uranium explorers (like the Rare Earth explorers) are particularly notorious for talking a good game but not having the least iota of intention to actually bring whatever they have found to production. It is the typical "few-to-many" relationship with scores of uranium wannabes versus a mere handful of actual producers. The "wannabe" aspect is not "wannabe producer" but rather "wannabe bought". The problem with this is that there has been a polarization in recent times. A number of African projects (mainly Namibia) have been bought by Chinese companies and uranium majors, likewise Athabasca properties have tended to consolidate with existing players in that province while US properties have gone to other companies with an interest in US production. Latin America, which was mainly Argentina anyway, has been deemed to be off the beaten track. Australia, curiously, has become less of a focus that it was 40 years ago when it had a number of producing mines.

Thus players in areas outside Namibia and Athabasca (or Wyoming/Texas) need to struggle to get airtime with potential acquirers and it's even harder to obtain portfolio investors if the stock is not seen as a potential target. Therefore the dialogue has to change form "find it and they will come" to one

where the company speaks of finding a project and developing it with a view, at least in Argentina, to becoming a key part of the domestic supply chain for the renascent nuclear power industry.

Argentine Politics – the State of Play

For anyone with any sense of Argentine history the current political situation is redolent of late 2001. The rushing sound of the waterfall is ahead and the current Administration is heading towards it in a barrel. The basic problem is that certain chickens are coming home to roost from years of featherbedding and special interest lobbying. The energy subsidies put in place to mollify the population after the 2001 devaluation have now become enormously expensive and distortive. Similarly transfers to the politicized lower echelons of society have been selective and expensive creating an urbanized class of "rabble for hire" who require constant "*panem et circenses*" and this costs the Federal government seriously large amounts of cash. Meanwhile the import replacement regime has raised costs and lowered quality, while not especially augmenting internal development of replacement industries. The side-effect of this was the make the country one of the most expensive locations in the world in late 2012 with burgeoning wage-push inflation in response to food price inflation. The dam broke on this latent bubble in early 2013 with the currency plunging and prices starting to look more reasonable. But then, as always, wages started to play catch-up and the government presided over the creation of a two currency situation where a parallel peso-dollar rate differed widely from the official rate for exporters etc. Gradually access to dollars has been restricted despite a sizeable reserve holding of nearly USD$50bn which has increased the sentiment of being pressure-cooked amongst the dollarized classes and those engaged in trade with the exterior. Argentines travelling have been effected and it has had an impact on tourists visiting the country.

With the situation deteriorating on all fronts and pushback occurring from the media, middle classes and repressed members of the President's own Peronist party the end is starting to look nigh in an all too familiar way. So the two key questions are: when shall the Administration fall? And what shall replace it? As for the former, the wisest thing for the current incumbent would be to ensure that the helicopter (the traditional exit vehicle from the Casa Rosada) is kept well fuelled as the date of the downfall is most likely dictated by when the enemies get organized more than when the public get frustrated enough. The natural succession in Argentina falls to the Vice President and then to the speaker of the Chamber of Deputies. The VP is Amado Boudou, however as events in 2001 showed, the succession can go out the window with mere lip-service being paid to the individuals who are "next in line". The fact that nostalgia is arising for Eduardo Duhalde, who was widely seen as the "hidden hand" behind De la Rua's fall and eventually ended up as President *de facto*, should provide some comfort for those worried about "what next?". He has played his game skillfully with a super-low profile during the current administration, letting it basically hang itself.

Thus for mining (and nuclear energy) prospects we can see relatively little downside from the current situation and quite a lot of potential to improve the political risk profile.

Farther Afield

Beyond Argentina there are regional possibilities, but these do not have the internal logic that Argentine uranium for uranium plants have. Brazil's nuclear power generation capacity consists of two pressurized

water reactors, Angra I, with a net output of 637 MWe, first connected to the power grid in 1985 and Angra II, with a net output of 1,350 MWe, connected in 2000. Work on a third reactor, Angra III, with a projected output of 1,405 MWe, began in 1984 but was halted in 1986. Work started again in June 2010 for entry into service in 2015.

We learnt recently that Brazil's own uranium mine isn't sufficient to supply its newest reactor and thus the country will start importing uranium, which opens another ready market in South America for Argentine output. We would note though that Brazil has the sixth largest uranium reserves in the world and in light of the traditional Brazilian self-sufficiency policies, buying uranium from Argentina would at best be only a stop-gap measure.

Risks

The main risk for most uninformed observers would be Argentina itself but as we hoped to dispel in this note there are various reasons why Argentina should embrace the possibility of domestic uranium production. Indeed Argentina has a regime that is both pro-mining and pro-nuclear, a rare combination. Despite those positives we would note the following risks:

- Argentina is teetering on the brink of one of its “once a decade” crises with the current Administration appearing to have its days numbered
- Uranium prices remain mired in despondency with one camp feeling this is a cycle that shall not be broken
- Uranium production, even when conducted by the government, has attracted some opposition in Argentina in the past
- Financing remains a problem
- Some provincial governments are against open pit mining and maybe against mining of radio-active materials as well.

Much depends on the level of national sanction given to any given project by the national government. Mining by state interests in Argentina has been traditionally very poorly managed and massively loss-making. It also frequently involved pursuing low-grade deposits of coal and iron for nationalist considerations. Thus it is no surprise that despite the resurgent nuclear power program the government has done little to reactivate the mines that CNEA has either exploited in the past or mooted as attractive for future exploitation. This means that the government, if it truly wants a vertically integrated industry, shall have to give its blessing to one of more of the foreign operators and that blessing (in light of the various carrots and sticks at its disposal) should cow (or should we say convince?) provincial governments into cooperation. This would mitigate then most of the potential internal opposition.

Conclusion

The followers of the uranium market are often likened to the Boy Who Cried “Wolf” because they have so often called the turn in the market in recent years and yet that has never manifested itself in higher prices or a return to the golden days per-2008/pre-Fukushima. But like the Boy they may eventually find they are right but no-one will have listened. Certainly the Russian program of converting weapons to energy fuels is nearing its end and certainly the number of nuclear plants, particularly in emerging

economies is burgeoning. Certainly the Japanese are backtracking on their step away from nuclear power and we feel the Germans will ultimately need to do likewise. All of these factors give enhanced strength to the arguments of the uranium bulls. Moreover the strongest argument bears currently have is "why isn't the price going up?"

To derisk such a story the best logic is to search for a uranium property in a natural market. Clearly Argentina is a natural market with an existing nuclear power plant fleet that is currently under expansion and yet no indigenous mine production of Uranium. What should be an ideal investing environment is clouded by the generalized negativism towards Argentina. This ongoing bad vibe, perversely, is justified by political and financial events but NOT by mining events because the government in Argentina remains pro-mining. It has long been the case that some provincial governments have followed a more erratic attitude to mining in their bailiwicks. So the ideal uranium development story in Argentina is one in a pro-mining province and at some distance from any substantial settlement. Few miners dabbling in the Argentine space though appear to have cottoned on to the possibilities presented by making themselves an integral part of the revived nuclear power program in Argentina.

Negotiating concessions and even obtaining funding (helped by giving the Federal government some participation) could go some way towards mitigating the current hostility from capital markets towards funding uranium exploration ventures. A key factor though must be credibility, for as we have noted many uranium companies are as prone as Rare Earth companies were towards pursuing solely the concept of proving up a resource and not developing it, and that in no way moves the Argentine nuclear energy industry towards vertical integration. ONLY those intent upon development and production in the short term can hope to create a real dialogue.

The goal of this note is not to point out winners and losers but rather to illuminate to investors that in Argentina there is a real prospect of a self-supporting uranium industry evolving. There would appear to be a compelling logic for a coherent mine to generator vertical integration in the Argentine nuclear industry with the only thing lacking is a project advanced enough to capture the government (and CNEA's) imagination to make this happen. The four companies we cover here have pushed ahead despite the odds stacked against the uranium mining space and negative sentiment on Argentina in general. At this point U3O8 and Blue Sky would look to be the most serious contenders.

Important disclosures

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