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Uranium Report 2021

Everything you need to know about uranium!

SRC swiss resource capital ag

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Preface

Dear Readers,

With this update of the Uranium Report 2021 we are already in the fifth year of this special report series. Uranium has recently shown relative strength again, which can be attributed to the great imbalance of a decreasing supply and a simultaneous increasing demand. Without the emission-free and at the same time base-load capable nuclear power, which is based on the „fuel“ uranium, many countries will not only have a huge problem in the stable basic energy supply and, due to the electromobility revolution, a real power supply problem in itself, but will completely lose sight of the goal of a world that is as CO_2-free as possible. The expansion of the hybrid and fully electric model range is progressing rapidly, and the development of the charging infrastructure will really explode in the coming years.

This raises the question of where all the green electricity is to come from. Nuclear power will be the only viable solution for many years to come, since solar and wind power will not be able to meet the base load as long as no adequately large storage facilities for electricity from renewable energy sources are created. In Germany in particular, this question is even more pressing as nuclear power is being shut down and coal is also disappearing. Once again, it is worth taking a look at China, where a balanced mix of photovoltaics, hydroelectricity, wind power and, above all, nuclear power is being used. China has understood that they need a reliable, clean and cheap power supply, and nuclear power is the perfect solution. This report is intended to provide the gentle reader with an overview of the uranium industry and the real facts, as well as the world‘s energy supply from nuclear power.

The closure of many large uranium mines in recent years could be the ignition point for rising uranium prices in the future. As before, supply is falling, and demand is rising.

Of course, we also present some interesting companies in the industry with facts and figures. This is to be understood as a suggestion and not as a recommendation to buy, as there are only very few listed companies left at all. Raw materials are the basis of our entire economic life. Without raw materials, there are no products, no technical innovations and no real economic life. We need a reliable and constant basic energy supply for our highly industrialized world.

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Yours, Jochen Staiger

Jochen Staiger is founder and CEO of Swiss Resource Capital AG, located in Herisau, Switzerland. As chief-editor and founder of the first two resource IP-TV-channels Commodity-TV and its German counterpart Rohstoff-TV, he reports about companies, experts, fund managers and various themes around the international mining business and the correspondent metals.

Tim Rödel is Manager Newsletter, Threads & Special Reports at SRC AG. He has been active in the commodities sector for more than 15 years and accompanied several chief-editor positions, e.g. at Rohstoff-Spiegel, Rohstoff-Woche, Rohstoffraketen, the publications Wahrer Wohlstand and First Mover. He owns an enormous commodity expertise and a wide-spread network within the whole resource sector.

57-million-pound U_3O_8 supply deficit in 2020 melts inventories, modular small reactors provide future demand expansion

57 million pounds of U_3O_8, or the equivalent of about 32.5% of total annual demand, global uranium production fell short of demand in 2020, with 47 million pounds of U_3O_8 projected for 2021. This means that the uranium sector will have a supply deficit of more than 100 million pounds of U_3O_8 for 2020 and 2021 alone. And yet, the uranium spot price continues to remain at exceedingly low levels around US$30 per pound. This is likely due primarily to high stockpiles that have been built up since the Fukushima disaster of 10 years ago and have not yet been fully depleted. Until 2016, mines around the world kept producing record quantities, sometimes even at mining costs above the spot price. The fact that this system worked is due to the procurement methodology of the uranium market. Only small quantities are traded at the spot price, most of which are by-products of the mining of other raw materials. By far the greater part is traded via

Uranium price development over the last 5 years(source: own presentation)

long-term contracts. Recently, many power plant operators tried to secure their supplies at the cheap spot price in the short term. However, in view of an overflowing supply deficit, they are likely to return to the negotiating table shortly and renegotiate the expiring contracts (around 75% of total demand will soon no longer be secured by contract). The first signs of this are already evident. Until then, even producers, future producers as well as ETFs are buying the spot market empty, thus increasing the pressure on the utilities.

In addition to this, the development of so-called „Small Modular Reactors“ (SMR) is progressing rapidly. These are nuclear fission reactors that are smaller than conventional reactors, can be manufactured in a factory and then moved to an assembly site. Among others, a company owned by Microsoft founder Bill Gates is also working on implementing such reactors, one of which is already in use in ship form in northern Russia. This should create a huge surge in demand for uranium in the future, because there is no way around nuclear power as the only base-load-capable, emission-free energy source in the coming decades if the climate targets set around the globe are to be achieved.

Nuclear energy is currently the only base-load-capable energy source that can manage the balancing act between an enormously increasing demand for electricity and clean energy production! Uranium is irreplaceable for this!

Global energy demand has multiplied since the late 1980s. About 10% of the world‘s total energy demand is currently met by nuclear power. However, fossil fuels such as coal and crude oil are still mainly burned to generate energy. The increasing demand for a reduction in CO^2 emissions and the ever more noticeable phenomenon of „global warming“ are prompting energy-guzzling industrialized nations and emerging economies in particular to increase their energy efficiency and improve their CO^2 balance. The second important point is the ongoing electro revolution, which will not only allow us to travel almost 100% electrically in a few years, but at the same time will also bring a huge, additional surge in demand for clean energy. It is estimated that the demand for electricity will increase by 200% compared to 2020.

Base load capability, what is it?

Base load capability is the ability of a power plant to provide continuous, reliable electrical power. This includes nuclear power plants, coal-fired power plants, gas-fired power plants, oil-fired power plants and steam power plants fired with substitute fuels. Combined heat and power plants, biomass and biogas power plants can also be base-load capable under certain conditions, although fossil or renewable raw materials must also be fired for this purpose. The only base-load-capable electricity generation from renewable energy is by means of hydroelectric power plants, but this often requires a major intervention in nature.
Photovoltaic and wind power plants are not base-load capable due to their often highly fluctuating generation and thus feed-in.

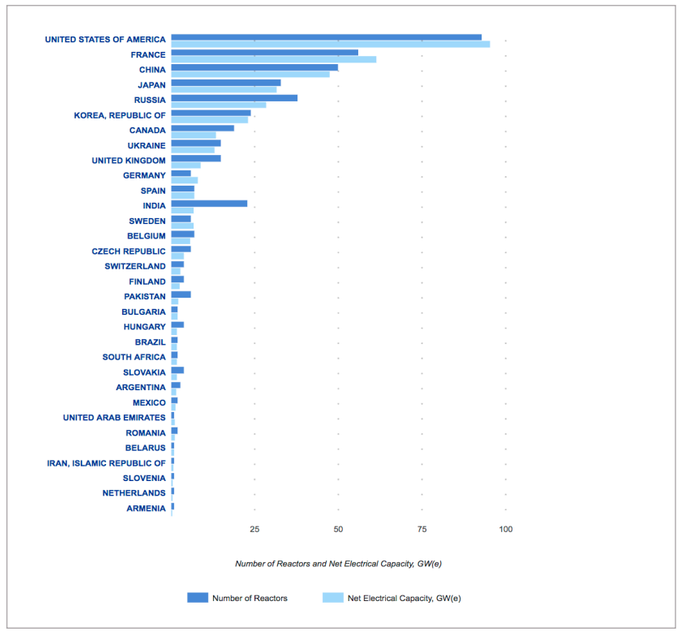
Both cannot be achieved at the same time by burning coal and oil. The alternative is renewable energies, which, however, require an enormous amount of time and money and, in addition, are not even close to base load capability without larger electricity storage facilities, or nuclear power, which can provide a great deal of energy in a CO^2-neutral manner. This possibility of fast and almost clean energy generation has long been recognized not only by climate protectionists such as Bill Gates or Greta Thunberg, but also by many countries worldwide, who are now pushing the construction of new nuclear power plants.

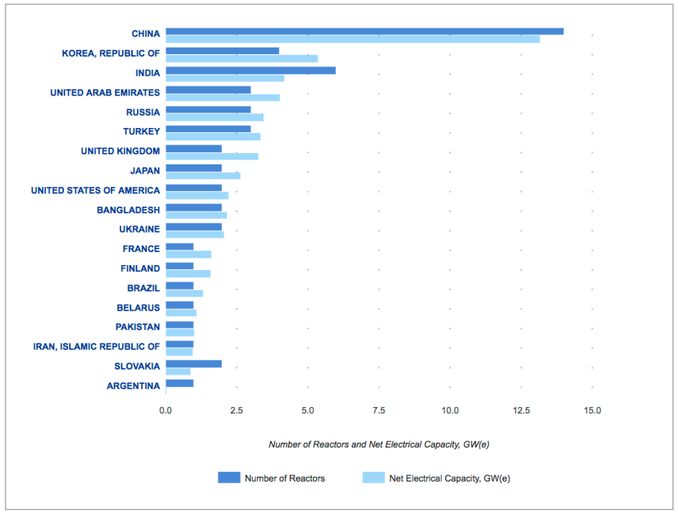
The number of nuclear power reactors worldwide has reached a record level

Despite the fact that nuclear power has been opposed at least since the Chernobyl disaster and even more so after the events surrounding the nuclear plants in Fukushima, Japan, the number of plants worldwide is already at a record high. 31 countries currently (as of April 2021) operate 444 reactors with a total net electrical capacity of about 394 gigawatts. Two more reactors have been added since the beginning of 2021 alone, and construction has started on two more.

With 94 reactors in operation, the USA is currently the leading nuclear power nation. However, emerging countries such as China and India are in particular need of more and more energy and have been focusing on a massive expansion of their nuclear power capacities for some time now.

Overview of currently operating reactors (blue) and net electrical power (light blue). (Source: www.iaea.org/PRIS)





It is therefore not surprising that 52 additional nuclear reactors with a total net electrical output of around 54.5 gigawatts are currently under construction. Planning has already been completed for around 120 additional ones, and more than 300 others are in the pipeline.

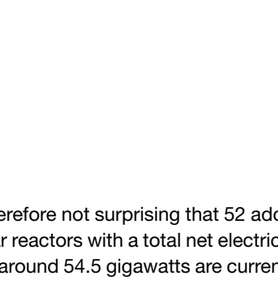
Overview of reactors currently under construction (blue) and the corresponding net electrical capacity (light blue) per country Source: www.iaea.org/PRIS.

Uranium basic knowledge

Uranium is one of only two elements for which nuclear fission chain reactions are commercially possible

Uranium is named after the planet Uranus and is a chemical element with the element symbol U and the atomic number 92. Uranium is a metal whose all isotopes are radioactive. Naturally occurring uranium in minerals consists of about 99.3% isotope 238U and 0.7% 235U.

The uranium isotope 235U can be fissioned by thermal neutrons and is therefore, apart from the extremely rare plutonium isotope 239Pu, the only known naturally occurring nuclide with which nuclear fission chain reactions are possible. For this reason, it is used as a primary energy source in nuclear power plants and nuclear weapons.



Occurrence

Uranium does not occur in pure form in nature, but always in oxygenated minerals. There are a total of about 230 uranium minerals that can be of local economic importance.
There is a wide range of uranium deposits from magmatic hydrothermal to sedimentary types.

The highest uranium grades are achieved in unconformity-bound deposits with average uranium grades of 0.3 to 20%. The highest grades are over 70% U_3O_8!
According to the International Atomic Energy Agency (IAEA), the largest uranium ore reserves are in the USA, Niger, Australia, Kazakhstan, Namibia, South Africa, Canada, Brazil, Russia, Ukraine and Uzbekistan.

Uranium mining

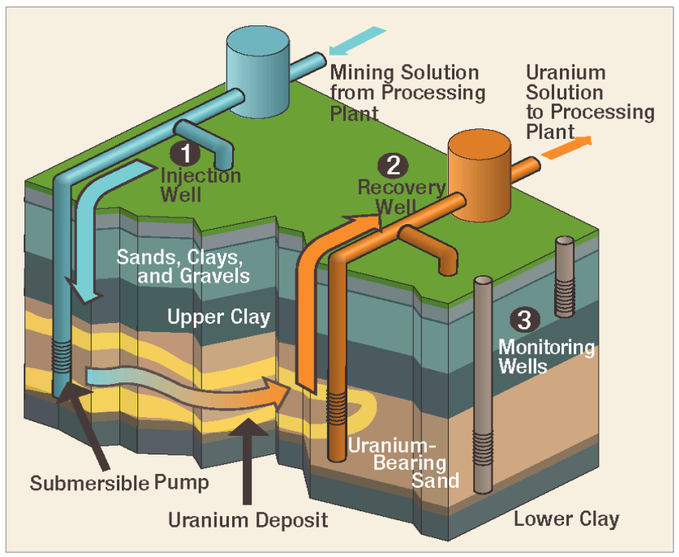
In uranium mining, a distinction is basically made between two processes: Conventional extraction and extraction by in-situ leaching or in-situ recovery (ISR). The exact extraction method depends on the properties of the ore body, such as depth, shape, ore content, tectonics, type of surrounding rock and other factors.

Conventional production

The majority of uranium is extracted by deep mining. The deposits are accessed via shafts, adits, ramps or spirals. Problems are often posed by the penetration of mine water and the so-called ventilation (technical measures to supply mines with fresh air). The exact mining method is chosen according to the characteristics of the deposit. Above all, the shape of the ore body and the distribution of the uranium in it are decisive factors. In deep mining, an ore body can be mined in a targeted manner, resulting in much less overburden than in open pit mining.
Near-surface or very large ore bodies are preferably extracted by open-pit mining. This allows the use of cost-effective large-scale technology. Modern open pits can be from a few meters to over 1,000 meters deep and several kilometers in diameter. Open pit mining often produces large quantities of overburden. As in deep mining, large quantities of water may have to be lifted for an open pit, but ventilation is less of a problem.

ISR production

In the ISR method, water and small amounts of CO_2 and oxygen are injected into the sandstone layers with the help of so-called injection wells, the uranium is dissolved out and pumped back to the surface for further processing with the help of so-called recovery wells. The entire process therefore takes place completely underground. The advantages of this process are therefore obvious: there is no need for major earthmoving as in open-pit operations, and there are no tailings piles or discharge ponds for heavy metals and cyanides. Only the wells are visible on the surface, and the land around the wells can continue to be farmed without restrictions. The ISR process also makes low-grade deposits economically mineable, and capital costs for mine development are greatly reduced. Moreover, the entire process can be carried out with a minimum of labor, which also drastically reduces operational costs. According to a study by the World Nuclear Association, 25% of uranium mined outside Kazakhstan recently came from ISR mines.



Description of in-situ mining: (1) pump a chemical solution - typically groundwater mixed with sodium bicarbonate, hydrogen peroxide, and oxygen - into the layer of earth containing uranium ore. The solution dissolves the uranium from the deposit in the ground and is then pumped back to the surface through recovery wells (2). Monitoring wells (3) ensure that nothing escapes from the drilling area. (Source: Wikimedia Commons, Courtesy of the NRC)

The current demand situation

The USA want to boost nuclear power again

With 94 reactors, the USA has by far the largest active nuclear power plant fleet in the world. Nevertheless, the USA is threatened with a collapse in energy supply. The United States is still the country with the highest per capita consumption of electricity in the world. And Americans‘ hunger for energy is growing. Many of the coal-fired power plants that date back to the 1950s and 1960s are operating inefficiently and uneconomically. They will have to be taken off the grid sooner rather than later. Electricity consumption, on the other hand, is rising steadily. So, the USA has no choice but to increase the number of its nuclear reactors in the coming years. Accordingly, the expansion of the nuclear power plant fleet is also part of the „Green New Deal“ initiated by President Biden, which is intended to lead the country toward CO_2 neutrality. Alongside the expansion of wind and solar energy, nuclear power is the top priority.
In recent years, more than 60 U.S. nuclear reactors have applied for lifetime extensions to 60 years of total operation. In addition, there are about 40 applications to build new nuclear power plants. To date, however, only 2 plants are under construction, and another 20 are in the concrete planning phase.

China goes full throttle in reactor construction

For several years now, it has been the giant empire of China that has been setting the pace in the construction of nuclear power plants. 50 reactors with a total net electrical capacity of 47.5 gigawatts are operated by the Middle Kingdom, which until now has primarily used coal to generate electricity. Of these, 11 new reactors alone have come online since the beginning of 2018. Nuclear power expansion in China is therefore enormous and taking place at breathtaking speed! It is to be expected that the Middle Kingdom will replace France as the current number two in nuclear power in a few years.
The Chinese government plans to build more than 80 new nuclear reactors in the next 15 years and over 230 new nuclear reactors by 2050. By 2030, a total of 110 reactors are to be connected to the grid, by which time the USA will have been replaced as the current leader. A total of 14 nuclear reactors are currently under construction, more than in any other country.

India massively expands nuclear program

India is following a similar path. The second most populous country in the world is planning to expand its nuclear energy capacity by 70 gigawatts.
Currently, a total of 23 Indian nuclear reactors are running at full load (7 gigawatts). One of them was recently connected to the grid.
Currently, 6 nuclear reactors are under construction in India, with 40 more to follow by 2050.

Russia with increasing nuclear capacity

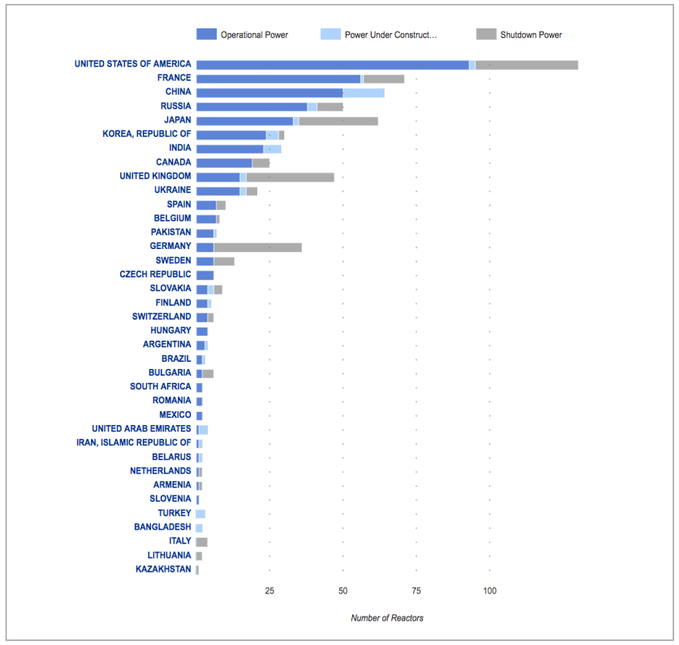
Russia has also announced a massive expansion of its nuclear power plants. The country currently operates 38 nuclear reactors with about 28.5 gigawatts. 3 plants are in the construction phase. In addition, Russia plans to build more than 40 additional nuclear power plants, which will increase the share of nuclear energy in Russia‘s energy mix from the current 15% to more than 20%.

Increasing global expansion of nuclear energy

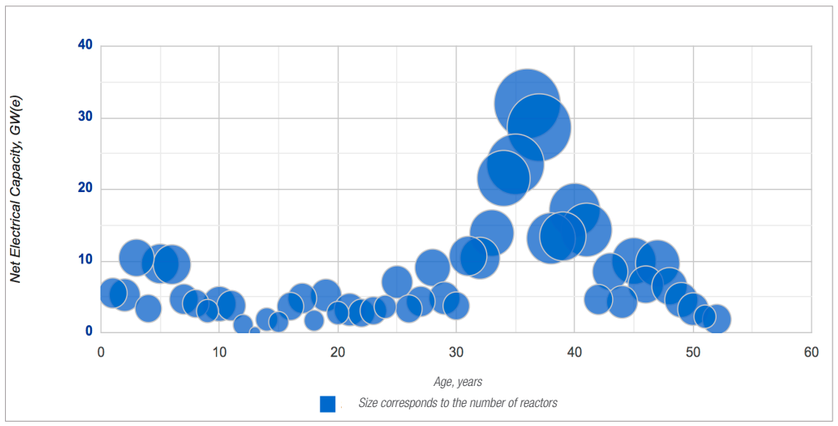
In addition to the 31 nations that already have nuclear reactors on the grid, another 17 countries are planning to install nuclear power plants. Among them are Egypt, Jordan, Turkey and Indonesia. In early March 2020, the United Arab Emirates became the 31st nation to enter nuclear energy production. Another 3 reactors are under construction there. South Korea currently has 4 plants under construction.

Long-term supply contracts to expire shortly

The previous cycle of contracting, dominated by the uranium price spikes of 2007 and 2010, has led plant operators to enter into contracts with higher price levels and very long terms of around 8 to 10 years. On the one hand, these old contracts are expiring, but on the other hand, plant operators have not yet looked for replacements for these supply volumes. As a result, the forward contracts of the plant operators are declining sharply, and thus the demand volumes for which there is not yet a contractual obligation, but which will have to be contractually secured in the future, are also increasing. Unmet demand is expected to exceed one billion pounds of U_3O_8 over the next 10 years. At the same time, more than 75% of expected reactor demand through 2025 is not contractually secured. For a thinly traded commodity such as uranium, this return to more „normal“ long-term contracts is likely to put tremendous pressure on both long-term and spot prices. There are therefore now increasing signals among international plant operators towards increased buying activity.



Overview of reactors currently in operation (blue), reactors currently shut down (gray) and reactors under construction (light blue). (Source: www.iaea.org/PRIS)



Overview of the age of currently operating reactors. Many will (have to) be replaced by more powerful ones in the coming years. Source: www.iaea.org/PRIS

The current supply situation

Uranium production declines sharply

In 2020, about 118 million pounds of U_3O_8 were produced as primary uranium from mines worldwide. This was significantly less than at the peak in 2016, when 162 million pounds of U_3O_8 were produced.
The supply side is in a state of upheaval, especially in the uranium sector. Secondary supply from Russia‘s disarmed nuclear stockpiles is becoming less and less important. Whereas in 2006 37% of demand was still covered by disarmed nuclear weapons, this figure is now only around 3%.

Deposits are stable – There is an acceptable range at higher uranium prices

At a market price of US$40 per pound of uranium, experts estimate that there are just under 715,000 metric tons of economically recoverable uranium. With annual consumption currently at around 68,000 metric tons of uranium, these deposits would last for just 10.5 years, provided the market price remained constant at at least US$40 during this period and demand also remained constant. However, demand will inevitably increase.

If the market price for uranium were to rise and justify extraction costs of US$80 per pound of uranium, about 1.28 million tons of uranium could be mined economically. Range at current consumption: 19 years.

If the uranium price were US$130 per pound, about 3.86 million tons of uranium could be mined economically. The known reserves would then last for about 56 years at current consumption levels.

Former producing nations struggle with weak uranium prices

The established uranium-producing nations of Australia, Canada, Russia and Niger were already having problems expanding their production before the Corona crisis. All four countries combined produced just under 19,445 tons of uranium in 2019. In 2009, the figure was 28,000 metric tons of uranium. In some cases, mines were shut down due to the weak uranium spot price or lack of further reserve availability (as was recently the case at the Cominak and Ranger mines).

US uranium production no longer exists

The U.S. uranium industry is a shadow of days gone by. Over the past 45 years, virtually nothing has been invested in developing new deposits, and nearly 95% of the uranium needed has been extracted from the disarmament programs. U.S. nuclear reactors already consume about 21,000 tons of uranium annually. Accordingly, an increase in capacity would also require an increase in the amount of uranium needed. The World Nuclear Association (WNA) estimates that by 2035, about 40,000 metric tons of uranium will be needed annually in the U.S. alone. Even at the peak of U.S. uranium production in the 1960s and 1970s, it would not have been possible to produce such a quantity from the own facilities. U.S. uranium production reached its previous peak in 1980, when about 29,000 tons of uranium were extracted from the ground. After the end of the Cold War, disarmed nuclear weapons in particular became the most important source of U.S. uranium requirements. This led to a decline in U.S. uranium production to, most recently, less than 500 tons of uranium annually. As a direct result, much of the infrastructure and licensed production facilities were simply closed or completely dismantled. Currently, there are only a few mines left in Texas, Arizona and Wyoming, but most of these have been shut down.

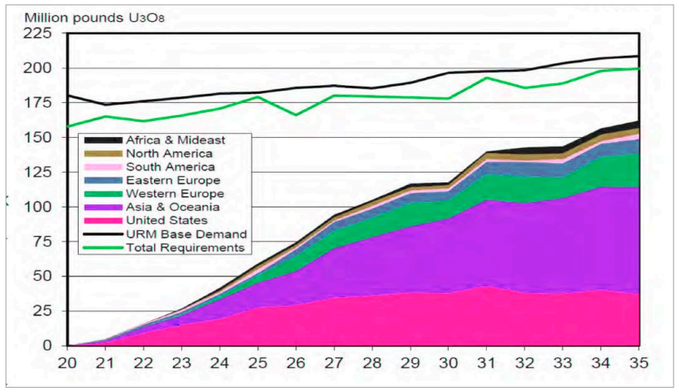
Kazakhstan – the new uranium superpower

While almost all established uranium producers are having difficulty rebuilding or expanding their uranium production, one region has now moved past all other countries to the top of uranium production: Central Asia. There, Kazakhstan in particular has been able to multiply its uranium production in the last ten years. From 2000 to 2019, uranium production in the former Soviet republic rose from 1,870 to over 22,808 metric tons. As a result, Kazakhstan also overtook the previous leader Canada in 2009 and is now responsible for around 41.6% of total global uranium production.

Massive production cuts to stabilize prices

Although Kazakhstan is one of the nations that can currently mine uranium at the lowest cost, the country is no longer prepared to sell off its uranium deposits at rock-bottom prices. In early 2017, the state-owned Kazatomprom announced that it would cut its own uranium production by at least 20% in 2017. In May 2018, Kazatomprom announced further production cuts. In addition, production had to be further reduced due to Corona.
But Kazatomprom is not the only uranium producer to cut production in light of the weak uranium price. Uranium major Cameco also announced production cuts and closed its McArthur River mine and Key Lake facilities indefinitely in January 2018. The Rabbit Lake mine was also closed, both of which are among the ten largest uranium mines in the world. McArthur River was the mine with the second highest uranium production and grades in the world. The temporary closure took 10% of the world‘s total production off the market in one fell swoop. In addition, Cameco has itself been acting as a uranium buyer for some time to service long-term, higher-grade supply contracts with corresponding uranium volumes at spot prices.

Since 2017, Kazatomprom reduced its uranium production by about 15% and Canada by about 45%. Furthermore, Cameco closed its Cigar Lake mine for one year in March 2020 due to Corona. Additionally, Orano‘s McClean Lake processing plant had to close as well. In addition, there are closures at Moab Khotseng in South Africa and at the Chinese-owned Husab and Rössing mines in Namibia, to name only the most important ones. The spot market, whose supply is mainly made up of uranium mined as a by-product in other mines, has also recently seen a decline in supply due to various mine closures.



Unmet need for supply(Graphic: own representation)

Huge gap in supply was already present before Corona

Even before the Corona pandemic, the supply deficit was about 40 million pounds of uranium per year. In 2020, the supply deficit was about 57 million pounds of U_3O_8, or just under one-third of global annual demand. Thus, most of the current demand is being met from stockpiles, which are thus rapidly running out. A de facto supply shortfall has already existed since 2017, with consumption at the current level of 444 nuclear reactors worldwide at about 175 million pounds of U_3O_8, of which only about 118 million pounds is covered by global uranium production (excluding the special effect of Corona).

A look into the future

Future supply deficit almost inevitable at current spot price

The International Atomic Energy Agency (IAEA) estimates that new nuclear power plant construction will increase global uranium demand to as much as 300 million pounds of U_3O_8 per year in 2030. A supply gap of 47 million pounds of U_3O_8 is estimated for 2021.

The fact is that the apparently cheapest and only base-load-capable CO_2-free way of generating electricity can only continue to be used if the market price for uranium, the initial product, rises again. In the case of uranium, too, demand and supply regulate the market price. However, if the market price no longer permits economic extraction, it must and will inevitably rise. In the case of uranium, there is also the fact that demand will rise sharply due to the construction of several hundred new nuclear reactors, so that the market price will benefit twice over. And thus, of course, also those investors who have recognized this trend in time.

The assembled Kilopower experiment, enclosed in a vacuum chamber at NASA's Glenn Research Center. (Source: NASA)

High proportion of demand remains unmet to date

Unmet demand is expected to exceed one billion pounds of U_3O_8 over the next decade. In this context, more than 80% of the expected reactor demand will not be contracted by 2025. For a commodity as thinly traded as uranium, this return to more „normal“ long-term contracts is likely to put tremendous pressure on both long-term and spot prices. Therefore, there are already increasing signals among international plant operators in the direction of increased buying activity.

Modular small reactors could become demand drivers

Another growth market for uranium is currently emerging in the form of modular small reactors, or SMRs. These are small 50–100-megawatt units that can be built in a modular fashion in a factory and transported to the eventual deployment site. These scalable units can provide carbon-free benefits while competing on cost with cheap natural gas or diesel and can coexist with grid-intensive renewables due to their load-sensing characteristics and zero-emission operation. The individual SMR units have a capacity of less than 100 megawatts and can operate for 3 to 5 years without fuel reloads – without interruption. They are very similar to the compact reactors that have safely powered aircraft carriers and submarines since the 1950s, and can be ideally marketed for smaller grids, island states, or remote locations (including mining and military bases). Very significant progress has been made in government support for these innovative, carbon-free energy sources in the United Kingdom, Canada, and the United States, with several projects and designs moving forward in 2021. Among others, Microsoft founder Bill Gates is also working with one of his companies to develop such small reactors. An existing example of such a power plant is the Akademik Lomonosov, which Russia commissioned in 2019 as a floating power plant in northern Siberia. A huge market that could cause uranium demand to skyrocket in the future.

US builds strategic reserve ...

The USA is also working on the implementation of SMR technology. First of all, however, the country is trying to become less dependent on the immensely high uranium imports, primarily from the successor states of the former Soviet Union. To this end, the U.S. Congress approved a budget that will provide $150 million annually over the next 10 years to create a strategic uranium reserve. This reserve is to come entirely from uranium from U.S. mines.

The main resolutions on this were:

- U.S. purchases of 17-19 million pounds of U_3O_8, beginning in 2021 (initially at $75 million) from domestic producers based on a competitive bidding process. Subsequent support is considered necessary over a period of up to 10 years to restore market share.
- Streamline regulatory reform and access to land for uranium mining.
- Support Commerce Department efforts to extend the Russian suspension agreement to protect against future uranium dumping in the U.S. market.
- Empowering the Nuclear Regulatory Commission to deny the importation of nuclear fuel produced in Russia or China for national security reasons.
- Establish a nuclear industrial base structure analogous to the defense industrial base.
- Financing advanced water treatment technology for uranium mining and in-situ recovery.
- Increase efficiency of export processes and adopt 123 agreements to open new markets for exports of U.S. civil nuclear technology, materials, and nuclear fuel.

In this way, the U.S. government is making some concessions to domestic mine operators in an attempt to revive domestic production. It is expected that U.S. producers will need an average uranium price of at least US$50 to US$60 per pound to be able to produce sustainably. At present, only Energy Fuels, Uranium Energy, Ur-Energy and Cameco are likely to restart their mining projects, although Cameco has already announced that this is not currently in the company‘s interest.

... and reduces uranium imports from Russia

In addition to these measures, in September 2020, U.S. President Trump signed an amendment to the agreement suspending the U.S. Department of Commerce‘s antidumping investigation of uranium from the Russian Federation, reducing America‘s dependence on Russian natural uranium concentrations by up to 75% from previous levels. The agreement was set to expire at the end of 2020 and allowed the import of about 20% of U.S. low-enriched uranium requirements from Russia. The U.S. Department of Commerce determined that the natural uranium and conversion components would be about 7% of U.S. enrichment requirements and no more than 5% beginning in 2026. This represents a reduction in Russian natural uranium imports of up to 75% from previous limits. In the context that the U.S. consumes about 47 million pounds of U_3O_8 annually, the initialed agreement reduces the annual limit on natural uranium components from about 9.4 million pounds of Russian U_3O_8 to less than 2.4 million pounds.

Uranium ETFs and uranium companies drive spot price up + Sprott gets in on the action

Only recently have several other strong market players joined the fray, now securing U_3O_8 on the spot market at a small price, mostly from mines where uranium is a by-product. In addition to Cameco, which is now a buyer, Uranium Participation Corp. and Yellow Cake Plc. were also able to purchase larger quantities of uranium. Yellow Cake used its US$200 million IPO proceeds to buy 8.4 million pounds of U_3O_8 from Kazatomprom with an option to buy uranium for 9 years for an additional US$100 million per year. This takes immense pressure off the uranium spot price and also builds pressure on utilities to renew their expiring contracts. Furthermore, uranium companies such as Uranium Energy, Denison Mines and Boss Energy also bought physical uranium in order to be able to act flexibly and fulfill supply contracts in the event of an early production start-up. The news that Sprott Asset Management took over Uranium Participation and thus formed the Sprott Physical Uranium Trust also attracted attention.

The best uranium stocks promise multiplication potential!

We have taken the current situation of a uranium spot price that is far too low and does not reflect reality, plus the massive supply deficit that is expected in the future, as an opportunity to provide you with a compact summary of promising uranium shares. In doing so, we focus primarily on development companies with extremely promising projects, as these also offer a high takeover opportunity in addition to the actual appreciation due to a higher uranium spot price in this context.

(Source: rawpixel)

Interview with Dr. Christian Schärer –
Manager of the Uranium Resources Fund and Partner of Incrementum

Dr. Christian Schärer is a partner at Incrementum AG, responsible for special mandates. During his studies he started to search for the strategic success factors of successful business models. A topic that still fascinates him today and inspires him in the selection of promising investment opportunities. He studied business administration at the University of Zurich and earned his doctorate while working at the Banking Institute Zurich with an analytical study on the investment strategy of Swiss pension funds in the real estate sector. He has acquired comprehensive financial market knowledge in various functions as investment advisor, broker and portfolio manager. Since the summer of 2004, Schärer has been focusing on various investment themes with a tangible asset character as an entrepreneur, consultant and portfolio manager. He also brings his practice-oriented financial market knowledge to companies as a member of the board of directors. He is married and father of a son. In his free time, he enjoys cooking for friends and family, hiking in the Ticino mountains or reading the biography of a fascinating personality.

Dr. Schärer, over the last few months, a two-track market development can be observed on the uranium market. While there has been little price movement in the physical uranium market, uranium shares have risen quite dynamically. What are the reasons for this differentiated market recovery?

I see the significantly improved investor sentiment and the sector-specific market structure as the main drivers behind the good performance of uranium stocks. Commodity stocks have generally benefited from portfolio shifts due to an improved economic outlook. This has also helped uranium stocks. In addition, the perception of nuclear power has changed as part of the global climate debate. According to the goals of the Paris Climate Agreement, energy supply in the future should be based less on fossil fuels. Alternative energies (wind, solar, hydropower) are to be expanded accordingly. In order to compensate for the unavoidable fluctuations in the production of alternative energy sources and to stabilize the power grids, reliable power generation (24/7) from non-fossil sources will also be needed in the future. Against this background, nuclear power is increasingly seen as a valid source that provides the base load for the power grid. Because nuclear power is produced with low CO_2 emissions, nuclear power plants are a possible component of the „New Green Deal“ for the Biden administration. In addition, an EU expert report has also recently given nuclear power a green label. Accordingly, the acceptance of the investment topic „uranium“ is increasing among investors. Last but not least, the current market structures have ensured that this interest has fallen on „fertile ground“. Despite the recent price increases, the aggregate market capitalization of shares from the uranium sector remains marginal. This is illustrated by the following comparison: Elon Musk‘s fortune amounts to around USD 170 billion. However, the market value of the weightiest uranium share (Cameco) is only around USD 7 billion. Against this background, even small capital allocations by institutional investors leave clear traces in the price development of uranium shares. Accordingly, the medium-term prospects remain positive against the background of further improving fundamental data.

In contrast, the physical uranium market has been rather subdued recently. We recall that the uranium sector went through a lean period for five years after the Fukushima nuclear accident. This ended with the temporary low of the uranium spot price at the end of 2016. Since then, the uranium spot price in particular has been able to rise again somewhat. However, the physical uranium market does not yet seem to be out of the valley of tears. Why is that?

It is indeed worth taking a closer look at the market development since the reactor accident in Fukushima. Only in this way can we understand how the uranium market has moved into the current attractive starting position as part of a shakeout process that has lasted several years. For the uranium sector, the Fukushima nuclear accident was a game-changing event that unbalanced the market. At the time, Japan had 54 reactors online, produced nearly 30 percent of its electricity from nuclear power plants, and generated about 1/8th of the world‘s demand for uranium. In addition, power plant operators had significant uranium stockpiles to guarantee security of supply. Following the incident, the entire reactor fleet was taken offline. About ¼ of these reactors were permanently shut down. The remaining plants were subjected to a tough safety check and some had to be extensively retrofitted. Accordingly, the restart of the Japanese reactor fleet is taking significantly longer and has brought fewer reactors back online than originally expected. As a consequence, demand for uranium was significantly lower.

Against this background, it would be expected that uranium production would be significantly reduced due to the slump in demand, thus bringing the market back into balance.

„Prices of at least USD 50 per pound are needed to bring production capacities that have already been shut down (in care and maintenance status) back into operation.“

But this has not happened. On the contrary. Production was even expanded under the leadership of the two sector heavyweights „Kazatomprom“ and „Cameco“. From an economic point of view, 3 factors have supported this behavior. On the one hand, „Kazatomprom“ has consistently exploited its relative cost advantages due to its „in-situ production method“ and its production location in Kazakhstan. With its low-cost base behind it, the company has risen to become the market leader (40% market share) in global uranium production. On the other hand, thanks to their full order books with long-term supply contracts on good terms, the other producers were able to largely escape the price pressure of the market in the early years. The market imbalances therefore did not diminish in the period from 2011 to 2016, but actually increased. The need for adjustment was all the greater as a result.

In this context, it is also important to understand that uranium demand by power plant operators is hardly price sensitive. This is because the total production costs of nuclear power are only marginally dependent on the level of fuel costs (uranium price). The most important cost block in the operation of a nuclear power plant is the capital costs (capitalized construction costs, which are depreciated over the entire operating life). Thus, the cost structure of a nuclear power plant differs significantly from that of fossil-fired power plants (high share of fuel costs in total production costs). This cost structure shapes the inventory cycle or purchasing behavior of nuclear power plant operators. It is not the absolute level of the uranium price that primarily drives uranium demand, but rather security of supply considerations. Anyone who invests billions in the construction of a nuclear power plant also wants to be able to operate it! From this point of view, the behavior of the power plant operators is not surprising: good availability and low price of uranium do not lead to an increase in stockpiles, but to their reduction. This put additional pressure on the market.

In 2016, the turnaround on the uranium market was triggered by the realization that economic realities can be ignored but never permanently overridden. The full order books of uranium producers with their guaranteed purchase volumes and prices fixed at a high level had in the meantime been largely worked off. Continuing to produce and sell uranium on the spot market at prices that did not cover costs was not an economically viable prospect in the long term. From a business perspective, it made more sense to leave the uranium unmined in the ground and wait for better times. Accordingly, obligations under existing supply contracts were increasingly covered by purchases on the spot market. In addition, Kazakhstan also realized that its dominant market position was not earning enough on the bottom line due to the low prices realized. This laid the foundation for a shakeout on the supply side. As a result of initial production cuts, the uranium price entered a bottoming-out phase after years of price correction.

Since 2017, several major uranium producers have closed mines, reducing supply. The Corona pandemic again led to mine closures or lower production volumes, especially in mines where uranium is a by-product and ends up on the spot market.

To what extent will this supply shortage lead to an improvement in the current situation of the uranium sector?

In this context, it is important to distinguish between strategic and cyclical market developments. The Corona-related production cuts have relieved the market in the short term as part of a cyclical fluctuation and supported the spot price. This was because, due to interruptions in production, renowned producers were no longer able to cover their delivery obligations from their own uranium production, but only with purchases on the spot market. This was a welcome contribution to the desired stabilization of the market. However, these capacities will sooner or later find their way back into the market, as the example of Cameco‘s „Cigar Lake“ mine has recently shown. This also applies in particular to producers where uranium is a by-product of the production process.

More important for the further development of the uranium price, however, are the changes at the strategic level. Under the leadership of the two heavyweights „Kazatomprom“ and „Cameco“, the supply side has attempted to lead the uranium market back to a new equilibrium over the past four years with significant production cuts. We are seeing previously unknown supply side discipline in the market. As a result, global mine production is likely to have reduced by around a quarter compared to 2016.

These production cuts reflect nothing more than the recognition of economic realities by uranium producers. From the mine operators‘ point of view, the ratio of the production costs of their existing capacities (ASIC – All In Sustaining Costs) to the spot price is relevant. If these costs are higher than the selling price realized on the spot and forward markets, then uranium production makes no sense from a strategic point of view.

In the current environment, the economic reality for uranium producers is as follows: Both spot and forward prices are hovering around USD 30 per pound. Global demand is approximately 180 million pounds. In total, around 125 million pounds were probably produced last year. The market is accordingly in deficit and the resulting supply gap is being met from non-strategic stocks as well as from secondary sources. This is a development which, in view of the declining stockpiles, does not appear to be sustainable and is likely to be accentuated in the coming years due to the economic realities (ASIC) on the part of the mine operators. This is because less than 100 million pounds of current production is mined at a maximum cost (ASIC) of USD 30 per pound. Consequently, a good 30% of the current production is not cost covering from an economic point of view and thus not sustainable! Consequently, the accentuating supply gap can only be closed by significantly higher uranium prices. Prices of at least USD 50 per pound are needed to bring production capacities that have already been shut down (in care and maintenance status) back into operation. For new mining projects to be realized, uranium prices need to be sustainably established above the USD 60 mark. It must be taken into account that even the „only“ decommissioned capacities are not available again at the push of a button. Recommissioning takes time and costs money. Not to speak of the realization time of new mining projects...

Until now, we have focused our discussion exclusively on the supply side of the uranium market, which is under pressure. However, the demand side is also on the move. It is worth noting that, despite the nuclear phase-out in the German-speaking world (Germany, Switzerland), global electricity production from nuclear power plants has again surpassed the old highs from before the events in Fukushima. In particular, the expansion of reactor fleets in China, India, the Middle East or Russia is leading to a net growth in demand of around +2% p.a. despite various reactor shutdowns in the Western industrialized countries. As already noted in the introduction, this expansion of nuclear power is driven by the steadily increasing demand for low-CO_2 base load in the power grids. Nuclear power plants produce in a 24/7 rhythm and help to balance the large production fluctuations of wind and solar plants and thus stabi-

incrementum

lize the power grids. In addition, nuclear power is a welcome trump card in the fight against air pollution as well as import dependence in fossil fuels. What also strikes me as remarkable is the fact that this growth is characterized by high visibility. Nuclear power plants do not appear or disappear overnight. Planning and construction cost a lot and take a long time. But once a reactor is up and running, operators aim for high utilization of production capacity over its entire 40-plus-year life, if possible. This transparency of demand development clearly distinguishes the uranium market from the cyclically sensitive commodity markets in the base metals or energy sectors.

In summary, looking at the current constellation on the uranium market, we note that, on balance, a further expanding supply gap is emerging. Around 30% of current uranium production is unsustainable from an economic point of view. At the same time, the demand side is growing at around 2% p.a. The supply gap (demand > mine production) will consequently widen. So far, the deficit has been covered by reducing non-strategic stock positions and from secondary sources. However, destocking is likely to soon reach its limits in view of the security of supply sought by power plant operators. The conclusion from my point of view is clear: the risk on the uranium market is about to move from the supply to the demand side. The demand side will become the catalyst for a significant price increase with the start of the new inventory cycle. This is the only way to close the growing supply gap.

This year we have observed a new phenomenon on the uranium market. In addition to the two holding companies „Yellow Cake“ and „Uranium Royalty“, non-producing companies (as yet) have also appeared as buyers on the uranium spot market. How do you interpret this development?

These purchases of physical uranium on the spot market by „Uranium Energy“, „Denison Mines“ and „Boss Energy“ are indeed remarkable. They have occurred, in my opinion, for 3 reasons. First, they reflect the positive market assessment by the decision makers involved. They obviously assume that the shakeout on the spot market due to destocking is already well advanced and accordingly a price recovery is foreseeable soon. Secondly, these purchases show that refinancing opportunities on the uranium market have improved significantly as a result of the rise in share prices. The capital increases required for this are also easier to justify to shareholders because of the lower dilution. And thirdly, these purchases give companies more room for maneuver. With the physical uranium stocks in hand, it is also easier to conduct credible negotiations on long-term supply contracts with potential buyers and financing banks.

„It is worth noting that, despite the nuclear phase-out in the German-speaking world, global electricity production from nuclear power plants has again surpassed the old highs from before the events in Fukushima.“

The U.S. in particular is working to get its uranium industry going again. How do they plan to achieve this?

The background for the various initiatives and proposals to support domestic uranium producers is the fact that U.S. nuclear power plants provide about 20% of the nation‘s electricity production. However, due to low uranium prices, uranium production from domestic mines has collapsed in recent years and almost all of the uranium needed for production must be imported. However, a good 40% of these imports come from countries that are considered politically untrustworthy from a U.S. perspective or are outside the U.S. sphere of influence. This brings the issue of supply security into focus. Accordingly, the U.S. Department of Commerce has developed various recommendations for action based on a study of supply security. Common to all is the intention to incentivize and support uranium production from domestic sources.

In the latest budget proposal of the US government, the proposal to build up a strategic uranium reserve was included. Up to USD 1.5 billion is to be made available for this purpose over the next 10 years. However, much is still unclear with regard to implementation. Moreover, the deal is only a proposal within the current budget process, and it still has to be approved by the parliament. It is also unclear whether the next administration will continue to support the project. It is also not settled at what price the uranium will be purchased. At a fixed price that covers production costs. Or at the current spot price? Depending on the definition of the purchase price, there are different volumes that could be acquired with the said US$1.5 billion. It also remains unclear from whom to buy. However, the non-existing domestic production capacity is precisely the origin of the initiative. So, a lot of things have not been thought through yet. But the impetus has been set.

You are the manager of the Uranium Resources Fund (ISIN LI0224072749) of LLB Fundservices AG in Liechtenstein. What strategy are you pursuing and what does the fund actually represent?

An investment in our Fund is a focused bet on the widening supply gap in the uranium market. Despite the recent price rises, investors with a medium-term investment horizon can expect an attractive return potential, although this is also subject to corresponding risks. The Fund is therefore suitable as a supplementary component in a diversified portfolio and not as a basic investment. The Uranium Resources Fund holds around 30 positions in the portfolio. This diversification makes sense against the background of the current state of the uranium market.

What selection criteria do you use when choosing fund stocks, and what are your current top performers?

Although the price recovery on the physical uranium markets has been hesitant so far, we are convinced on the basis of the fundamental starting position that the uranium market will make the sustained upward turn in view of the growing supply gap. However, interim setbacks and high volatility remain a feature of this tight market. The still young bull market in uranium stocks will open up large profit opportunities. We want to consistently exploit these while accepting controlled risks!

Against this background, our portfolio stands on four pillars. The first pillar is our strategic liquidity ratio. This ensures our ability to act at any time. In this way, we take advantage of attractive entry points that regularly open up due to the volatile price performance of many uranium shares.

With the second pillar, we want to participate directly in an improvement in the uranium spot price. Without higher uranium prices, a sustainable recovery of uranium producers is difficult to imagine. That is why two investment companies, which have invested their funds mainly in physical uranium, form the core of the portfolio. If our view is correct, the supply gap in the uranium market will be closed via a rising uranium price. „Uranium Participation“ and „Yellow Cake Plc.“ should accordingly be the first and most immediate beneficiaries of this price recovery. We have added to this group with a position in Uranium Royalty Corp. The company adapts the „streaming and royalties“ business model, which has been successful mainly in the precious metals environment, to the uranium market. The company finances uranium mines and in return secures a share in current or future production. However, this is done without taking on the risks associated with operating a mine.

incrementum

„The supply gap and the associated potential for rising uranium prices are still only foreseeable, and the expected turnaround on the physical uranium market is still a long time coming despite the good fundamental prospects.“

The third pillar focuses on the shares of uranium producers or standby producers with approved and/or realized projects that are not currently in production. When uranium prices start to rise, the producers who can place significant uranium production on the market will benefit. Only those who produce can also deliver. To be on the safe side, we focus on companies that have low production costs on the one hand and a good order book of long-term supply contracts on the other. Significantly represented in the portfolio are the two industry leaders „Cameco“ and „Kazatomprom“. Both companies have a broad portfolio of first-class production sites. Despite the challenging environment, both companies are cash flow positive and pay a decent dividend. This group is complemented by investments in companies to which we would give the status of „standby producer“. These are companies that have a portfolio of approved production facilities and processing capacity. Production could be launched within a foreseeable period of time as soon as the economic conditions (i.e., a higher uranium price) are met. We include „Uranium Energy“ or „Energy Fuels“ in this group, for example.

Under the fourth pillar, we focus on explorers and developers that are advancing world-class development and mining projects. These are particularly interesting if they can start their production in the time window of the expected supply gap. They will then be able to benefit from correspondingly attractive sales prices. In addition, these assets should have the necessary size to also qualify as takeover targets. After all, we assume that a wave of consolidation will take place on the uranium market once the price turnaround has occurred and that mining companies from outside the sector may also want to position themselves in the uranium business. This would make sense not least because of the low cyclical sensitivity and the comparatively high visibility of uranium demand. For example, the companies „Denison Mines“ or „Boss Resources“ can be assigned to this group.

What advice do you have for investors interested in investing in the uranium sector?

The supply gap outlined above and the associated potential for rising uranium prices are still only foreseeable, and the expected turnaround on the physical uranium market is still a long time coming despite the good fundamental prospects. If, contrary to expectations, the current bottoming phase continues for a longer period, the air will quickly become thin for some uranium producers. Their balance sheets have been eroded by the continuing collapse in prices and their cost-cutting potential has already been largely exhausted. The environment also remains challenging for developers of new uranium projects, as their projects will only become economically viable and therefore feasible as uranium prices rise. Accordingly, it is difficult to find investors to finance the next project stages. Anyone who puts all their eggs in one basket in this constellation is playing for high stakes – possibly even too high. The use of a fund that invests in a diversified manner within the theme seems reasonable to me. In addition, we recommend a staggered build-up of positions.

Interview with Scott Melbye

Executive Vice President of Uranium Energy, Commercial V.P. of Uranium Participation Corp. and Ex-Advisor to the CEO of Kazatomprom

Scott Melbye is a 35-year veteran of the nuclear energy industry having held leadership positions in major uranium mining companies as well as industry-wide organizations. Through to June 2014, Melbye was Executive Vice President, Marketing, for Uranium One, responsible for global uranium sales activities. Prior to this, Melbye spent 22 years with the Cameco Group of companies, both in the Saskatoon head office and with their U.S. subsidiaries. He had last served as President of Cameco Inc., the subsidiary responsible for marketing and trading activities with annual sales exceeding 30 million pounds U_3O_8. Melbye was formerly the Chair of the Board of Governors of the World Nuclear Fuel Market and President of the Uranium Producers of America. He also currently serves as Executive Vice President of Uranium Energy and VP-Commercial for Uranium Participation Corporation and was Advisor to the CEO of Kazatomprom, the world's largest uranium producer in Kazakhstan. Melbye received a Bachelor of Science in Business Administration with specialization in International Business from Arizona State University in 1984.

Mr. Melbye, you have held and continue to hold senior positions with a variety of uranium companies and are considered one of the world's most respected uranium experts. Can you give our readers a brief overview of your career to date?

Thank you, it is a pleasure to share my observations and insights into the global uranium market with your readers. I have been fortunate to spend my entire 36-year career in the uranium and nuclear energy industries. Starting out as a nuclear fuel broker with Nukem in New York on 1984, and later being responsible for uranium fuel procurement at the three-unit Palo Verde Nuclear Generating Station in Arizona, really prepared me for the bulk of my career in uranium mining. In addition to 23 years with leading producer, Cameco, most recently as President of their global uranium marketing subsidiary, I also held leadership roles at Russian-owned, Uranium One and Kazakhstan's State uranium company, Kazatomprom. I have also had the opportunity to manage the physical uranium activities of Uranium Participation Corp. Since 2014, I have served as Executive Vice President of U.S. uranium developer and producer, Uranium Energy Corp., and more recently assumed the CEO role at Uranium Royalty Corp. which launched as a public company in December 2019.

The uranium spot price has been in a bearish phase for about 5 years and has not yet been able to recover significantly from its low in 2016, until very recently. What are the main reasons for this development?

While we are very encouraged by the recent improvements in the uranium spot market (up 63% from 2016 lows), it has indeed been a frustratingly slow recovery with prices moving sideways or rallying temporarily, only to fall back to previous levels. With the benefit of hindsight, we can now see that 2016 was a pivotal year for uranium fundamentals. As a result of Fukushima market impacts, the uranium price fell from a ten-year high of US$70 per pound in early 2011 to a cycle low of US$17.75 per pound in November 2016. Today, uranium prices have been fluctuating above and below $30 per pound. In the face of falling prices over the past decade, global uranium production counter-intuitively grew, year-over-year, and finally peaked in 2016 at 162 million pounds. This speaks to the relative inefficient nature of the uranium market compared to other mineral commodities like copper, gold or silver. In those commodities, price signals usually manifest in adjustments to supply much more rapidly, in real time, as selling prices are more reliant on spot price indexing. In the case of uranium, the prevalence of hedged, long-term contracts at higher-priced, base-escalated terms insulated many producers from the lower spot prices. However, by the end of 2016 we began to see the rapid drop off of that long-term contractual coverage that was secured in the previous cycle, hence (finally) exposing producers to the depressed market conditions. The uranium market has, as a result, seen a steady drop in global uranium production from 2017 to the present. This has been a key supply development as it finally allows the critical drawdown of excess inventories over-hanging the market. These supply cuts have created a gap in 2021 between annual production (likely around 127 million pounds in 2021) and consumption (about 175 million pounds) of about 47 million pounds U_3O_8. In 2020 this gap was widened by reductions in mine supply to about 57 million pounds due to the Coronavirus pandemic which we will discuss in more detail.

With regards to the demand side during this period we also witnessed the closure of Japanese reactors (both temporary and permanent), and the gradual phase-out of German reactors in response to Fukushima. However, after a period of safety re-assessments and plant upgrades, we experienced a resumption of nuclear plant construction globally which remarkably returned global nuclear generation to pre-Fukushima levels in 2019.

This growth has also been helped by changing attitudes towards nuclear power, particularly in the climate change community where it is increasingly being seen as an important contributor towards a lower-carbon energy future.

So, this begs the question why the post-2016 recovery to-date has been so slow and stubborn? The main reason rests in a key catalyst which has only recently begun to re-emerge. Namely, the procurement activities of the world's nuclear utilities. Just as long-term contractual coverage has been rolling off for uranium producers in recent years, this has logically also been the case for their counterparty customers, the utilities. However, rather than rush back into new long-term contracts with producers, the utilities have been content to focus on spot and near-term procurement with prices that reflect the near term over-supplied market (spot prices have fluctuated in the $20-$31 per pound range). This has been especially compelling considering the utilities had been paying $40-$60 per pound, or higher, under older legacy contracts signed in the previous bull-market (the most famous example being the Cameco/Tokyo Electric Power contract at $100 per pound). The most appealing option for these short-term focused buyers had been the "carry-trade" facilitated by trading companies that buy spot material, carry it at historic low cost-of-money levels, and deliver two to three years out at fixed prices, which were at or below, $35 per pound. While this myopic view of future uranium supplies has had a very positive impact on the fuel costs of nuclear power plants, it has not provided the level of long-term incentive pricing for uranium producers to sustain or start up new production. In a uranium market that consumes between 170 and 180 million pounds of uranium annually (and heading towards 200 million), the forward contracting levels of utilities should be at or near those levels each year to avoid falling behind on future needs. To the contrary, UxC Consulting reported long-term contracting levels in the years 2013 to 2020 averaged about 67 million pounds per year (well below normal levels). Fortunately, a shift in buyer behavior began to be observed in the 4th quarter of 2019 and was continuing into 2020, until Coronavirus hit and again put a damper on long term procurement activities. While utilities can rely to some degree on shorter term strategies as a temporary measure (and have done so) the return to more strategic buying is not only inevitable, but imminent. Recent geopolitical developments with the U.S., China, Iran and Russia, as well as a completely idled uranium production industry in North America, have only reinforced this need. This long-awaited interaction between buyers and primary producers should support price formation in both the spot and long-term markets which tend to interplay off of each other. Of course, as the pool of cheap spot material has been depleted by spot purchasing and carry trade activities, the spot price will rise (hence putting upward pressure on long-term prices). A current debate among market observers exists as to whether this pool of spot supply is greater than expected, or conversely, is not that extensive after years of drawdown, but has simply not been tested yet by meaningful procurement levels. These supplies were challenged recently as a number of junior uranium development companies independently took the strategic step of buying uranium in the spot market, adding a valuable (under-priced) asset to their balance sheets. This purchasing (approximately 10 million pounds in total) moved the uranium spot price by $3 to $4 per pound in only a couple weeks. This, and the recent depletion and permanent closure, of two of the world's largest and longest running mines in Australia (Ranger) and Niger (Cominak), have accelerated the drawdown and moved us closer to a market which becomes driven more by the cost and availability of primary mine production.

Over the past three years, several of the leading uranium producers – in particular Cameco and Kazatomprom – have announced production cutbacks, some of them substantial. When will these have a significant impact on the uranium spot price?

Although there were some earlier exceptions, global production cuts really began to kick in during 2017 and are still a somewhat recent development. However, the magnitude of these supply cuts has reached significant levels, taking some 40-60 million pounds from the market each year over the past few years. With indications that these conditions are not abating, the cumulative impact is an accelerated drawdown of excess inventories. While this production discipline is quite widespread, affecting mines in the United States, Africa and Australia, the most profound impact has been seen in Canada. After shuttering their Rabbit Lake Mine in 2016, Cameco took their world-class McArthur River Mine offline in 2018. To put this into perspective, the McArthur River operation is the world's richest uranium mine with ore grades 100 times the world's average. Production had been approaching 21 million pounds annually. Cameco made the difficult, but logical decision, to suspend this production and instead meet their very substantial long-term contract book from spot market purchases. Not only does this move reduce fresh supplies to the market, it also accelerates the drawdown of excess inventories through their purchasing activities. It also preserves valuable geological resources in the ground until they can be mined at financial returns commensurate to their discovery, and development value.

The longer the prevailing market prices remain below incentive levels, additional production will be removed from the supply equation. While all of these cuts add to the needed economic "supply destruction", the keys still remain in the hands of world leader, Kazakhstan. Their State-producer, Kazatomprom, has also announced cuts from "planned production" in recent years, but many market observers assert that more could be done to help rebalance the market more quickly. These moves have currently capped their output at about 59 million pounds annually, which represents 40% of global supply. Incidentally, this growing reliance on a single country, under Russian (and Chinese) influence and in a volatile part of the world, has security of supply implications, and has begun to cause some utilities to rethink nuclear fuel diversification objectives. The recent acquisition of 49% of Kazatomproms's Ortalyk project by China's CGN Mining should put an exclamation point on the concern for western utilities.

The Coronavirus Pandemic has had profound impacts on the global economy, and we have now begun to see this affect major uranium operations around the world. Is this behind the recent dramatic increase in uranium prices recently?

Very substantial production cuts occurred as a result of the Coronavirus precautions taken to protect the health and safety of uranium miners, support staff and impacted communities. In the Spring and Summer of 2020, these announced mine shutdowns affected approximately 50% of worldwide monthly uranium output. Production cutbacks from Canada's Cigar Lake, Kazakhstan's operations, Moab Khotseng in South Africa and the Chinese-owned Husab and Rossing mines in Namibia, removed as much as 6-7 million pounds from the uranium market in the months these measures were in place. Most of these mines have since announced their resumption of development and mining activity, but the ramp up back to planned volumes has been slow and gradual. In fact, the Cigar Lake Mine in Canada restarted production, only to have to shut back down when COVID-19 cases spiked in the Province. They have recently announced (again) a return to production but the ramp up to full production will not occur overnight. In Kazakhstan, the biggest impact to production volumes occurred in 2021 due to the nature of In-Situ Recovery (ISR) mine development. The total reduction in global production from COVID-19 related causes is expected to have been about 19 million pounds, dropping annual production in 2020 to about 124 million pounds. In answer to your question, while this provided a tipping-point catalyst for uranium prices early in the 2020, the real driver will be the rebalancing of global supply and demand fundamentals over the past 4 years. Put another way, this Coronavirus "black swan" event has served to accelerate fundamentals that were already significantly improved going into 2020.

The Trump Administration recently released its comprehensive policy document on nuclear energy, including an initiative to invest a total of US$ 1.5 billion over the next 10 years in a national domestic uranium reserve. What impact will this have on the US uranium industry and the entire uranium sector?

In 2018, the U.S. Commerce Department initiated a Section-232 investigation into whether the extreme levels of foreign uranium imports (now effectively 100%) were posing a national security threat to the United States. The Trump Administration had recently invoked tariffs on steel and aluminum imports under a similar 232 investigation. While the Trump Administration decided against tariffs or duties on foreign uranium imports in July of 2019, the President did conclude that a threat to national security existed. As a result, Trump formed the U.S. Nuclear Fuel Working Group comprised of his Senior Cabinet Secretaries and Administrative Agency Heads. Their objective was to recommend policies to the President to revitalize and expand the domestic nuclear fuel cycle, including uranium. It should also be noted that in addition to the uranium requirements of the electric utility companies (nuclear is 20% of US electricity supply), the U.S. Defense Department requires U.S. origin uranium for the Navy fleet of 83 aircraft carriers and submarines. The report titled "Restoring America's Competitive Nuclear Energy Advantage – A strategy to assure U.S. national security" was released by the U.S. Department of Energy in April 2020 and provided the strongest policy support for nuclear energy since the Eisenhower Administration in the 1950's. A significant element of the plan was previously announced as part of the President's proposed FY 2021 Budget. In the budget, President Trump called for a 10-year program to establish a domestic uranium reserve funded at a rate of US$150 million per year. Through bipartisan support in the Congressional appropriations process, the program was officially funded for FY2021, albeit at a reduced $75 million level. While the program awaits implementation by the new Administration, and many of the specific details have yet to be announced, this is viewed as a very welcome stimulus measure providing supplemental demand for U.S. mined uranium, in addition to the broader market requirements of the nuclear utility companies. The Nuclear Fuel Working Group Policy also highlighted the national security risks of America's over-reliance on imported uranium, particularly from State-owned suppliers such as Russia. It urged the continued limits on Russian nuclear fuel supplies through the U.S. Department of Commerce agreement suspending the Russian anti-dumping investigation (so-called Russian Suspension Agreement, or "RSA"). The RSA had limited the import of Russian nuclear fuel supplies (uranium, conversion and enrichment) to no more than 20% of American uranium requirements, however, these limits were set to expire in December 2020. Since the U.S. Department of Commerce had indicated that the resumption of Russian dumping would likely occur in absence of restrictions, the conditions for a negotiated extension of the RSA were possible. This agreement has now been concluded between the U.S. and Russian Federation, extending restrictions for an additional 20 years. Furthermore, in line with the Nuclear Fuel Working Group recommendations, the amount of imports will decline over time (with the natural uranium component of Russian low-enriched uranium being significantly reduced from 20% of U.S. requirements, down to 7% over the period).

Do you see large new mines starting production in the next few years? What (spot) price will most companies need to push the development of new mines and bring their projects into production?

This is the key question facing the uranium market in the coming years. While new production is not needed today, we do not have to go very far into the future to see that restarts of idled capacity, and new mine start-ups, are required to meet robust and growing demand for uranium. However, in a "Catch-22" very similar to the previous bull market, the market price incentives have simply not been present in the recent sub-$30's spot market (and while the depressed longer-term market has been impacted by lower-priced carry trades). With every year that these conditions persist, and significant long-term utility uncommitted needs are looming, the likelihood of a supply crunch increases. The lead-times to permit, license and construct new uranium mines can be 6-10 years in duration and no level of uranium price can shorten those development times.

This, of course, begs the question of what price levels are needed to incentivize the additional supply going forward. Speaking very generally, the incentive price to return idled capacity into production, or advance the start-up of the most competitive new mine developments, is likely somewhere in a sustained $40-$50 per pound level. A point in case being the McArthur River Mine where restart thresholds have been indicated to fall in this range. The most competitive new mine developments that can advance in this range are likely restarts of idled mines (limited in number) or ISR operations, and those who are fully permitted and licensed (with smaller capital requirements) have an important first-mover advantage. For conventional mines requiring long permitting, licensing and development lead-times and large capital investment, they will likely require sustained prices in the $60+ per pound range.

What does the current demand situation look like? Who could be the driving force behind the revival of the uranium price in the future?

The current demand situation for uranium can be described as robust and growing. The previous bull market in uranium was, in part, fueled by future forecasted growth in nuclear power. Today, we are actually seeing these reactors being constructed and entering into commercial operation. The nuclear energy industry has seen 55 new reactors connected to the global grid in the last eight years, and 54 additional reactors are under construction. Global requirements for uranium are projected by the World Nuclear Association to top 200 million pounds annually in the coming years (2% annual growth in the reference case forecast).

Most importantly for current and future growth, we have begun to see public attitudes toward nuclear energy turn decidedly more positive in recent years. Former opponents of nuclear energy have softened their positions, or even spoken out in support of this safe, large baseload source of carbon-free electricity. At recent climate change meetings such as the COP 25 in Madrid, there has been an almost panicked realization that despite billions of dollars and euros spent on renewables in the past 25 years, very little progress has been achieved in global carbon reductions. Nowhere is this more evident than in Germany where the Energiewende commitment to renewables (without nuclear) has only resulted in electricity rates 50% higher than that of nuclear neighbor, France (who produce 1/10 the carbon emissions per capita). In the process, Germany has grown increasingly dependent on Russian natural gas, and ironically, French nuclear-generated electricity imports. None of this particularly comforting for Europe's leading economy which is based on energy-intensive manufacturing exports. This point is not to single out Germany's energy policy, but to highlight the difficulty, if not impossibility to achieve meaningful carbon reductions without a significant component of nuclear power in the energy mix. In the United States (California in particular), and in South Australia, we have begun to see serious electricity reliability issues as a result of an over-reliance on intermittent renewables. Note that these are all leading global economies, and not emerging markets where electricity shortages and blackouts might be more expected.

In that regard, many of those emerging markets, with large and growing populations, struggle to energize their economic growth without adding to extreme levels of harmful air pollution in their major cities. The good news is that nuclear energy can solve those problems with production of very safe, highly reliable, 24-7, carbon free, clean air electricity.

Another growth market for uranium is emerging from Small Modular Reactors ("SMR's"). These are not the 1,600 Mwe large reactors with large capital costs and long construction

Source: vlastas@shutterstock.com

times, but rather the small 50-100 Mwe units that can be constructed in a factory and shipped on site. These scalable units can provide carbon-free benefits while competing on cost with cheap natural gas and can co-exist with grid-heavy renewables due to their load-following characteristics. They are very similar to the compact reactors that have powered aircraft carriers and submarines safely since the 1950's, and can be ideally marketed to smaller grids, island nations, or remote locations (including mining operations and military bases). Very significant advances in government support of these innovative, carbon-free, energy sources have occurred in the U.K., Canada and United States, with multiple projects and designs advancing in 2021.

In the United States, the new Biden Administration is embracing nuclear energy as a central part of their clean-energy, carbon reduction goals. While this will be a difficult time for the fossil fuels industries, it is already being seen as a boost for preserving the existing fleet of 94 American reactors that provide 20% of U.S. electricity and over 50% of its carbon-free energy. It should also continue, or even advance, the U.S. Department of Energy's Advanced Reactor Development Programs that are funding a number of SMR and advanced reactor designs.

In summary, what do you expect for the uranium sector in the next two to three years?

In summary, expect very good things from the uranium market in 2021. This optimism is grounded in the most fundamental factors of supply and demand. Uranium has suffered a long, severe, bear market, but appears to have turned the corner. Any economist will tell you that no commodity will stay down, nor go up forever. Our uranium market is no exception, and it's unique and inefficient nature has caused market forces to manifest more slowly into higher prices. This prolonged, but very fundamental rebalancing, is already driving substantial appreciation in uranium equities. The continued growth in global nuclear energy, production discipline by existing producers and underinvestment by new producers, will continue to test the market fundamentals in the coming months. As global utilities return to more normal procurement levels, more upward pressure on uranium prices should develop. The Coronavirus crisis has shocked economic markets in ways few imagined and certainly grabbed the headlines during 2020 but has now been replaced by the growing realization of nuclear energy's role in a lower carbon future. In the meantime, however, a very compelling supply and demand narrative for uranium has emerged and should not be overlooked by resource investors seeking out-sized gains though this very safe, clean, green energy commodity. Opportunities exist with the well-run uranium companies that are positioned with quality assets and management teams that can capitalize on this story. Recent global mine cutbacks coupled with the green-energy mega-trend towards nuclear, may well be proving to be the long-awaited catalysts in a market poised for significant recovery.

Blue Sky Uranium

High-grade uranium deposits with the prospect of low-cost surface mining!

Nikolaos Cacos, CEO

In the vast majority of cases, a standard uranium mine extracts the corresponding rock underground, which drives up the construction and mining costs accordingly. The Canadian development company Blue Sky Uranium owns several huge uranium licenses in Argentina which, after reviewing the initial drilling results, should in all probability be exploitable in open pit, i.e., surface, operation. This is a huge cost advantage, promising not only faster mining but also high margins. The aim is to supply Argentina's nuclear power plants with their own uranium.

Amarillo Grande Uranium-Vanadium Project: Location, Resources and Mining Opportunities

Blue Sky Uranium's flagship project is called Amarillo Grande and consists of three sub-projects, Anit, Ivana and Santa Barbara. In 2010, Blue Sky Uranium was granted exclusive rights to conduct airborne geophysical surveys over an area of 2.265 million hectares. After a thorough investigation, the decision was made to acquire the exploration rights to Anit, Ivana and Santa Barbara, as they encountered several significant anomalies. These three license areas total approximately 261,000 hectares and are located in Argentina's Rio Negro province. Anit, Ivana and Santa Barbara lie within a 145-kilometer trend that hosts several known uranium occurrences. In addition to near-surface uranium mineralization, Amarillo Grande also hosts significant vanadium resources. The uranium and vanadium-bearing rocks range in depth from 0 to 25 meters, and the deposits can extend for several kilometers. The overburden consists of only slightly compacted sand, which results in not only favorable mining costs, but also extremely favorable drilling costs. Mining is usually carried out by means of a so-called scraper, which removes the rock layers and loads them directly onto a truck driving alongside by means of a conveyor belt. There is no need for drilling or blasting, which drastically reduces mining costs. In addition, most of the excavators normally required are not needed. The rock material can be processed in a plant centrally located between the three subprojects using leaching, which is also cost-effective. All these advantages make it possible to exploit even low-grade deposits. One example of such a mine is Langer Heinrich in Namibia. It should be noted that Blue Sky Uranium has the added advantage of additional vanadium resources.

Amarillo Grande Uranium-Vanadium Project: Ivana

The largest subproject by area and the southernmost is Ivana. It covers approximately 118,000 hectares and hosts an anomaly approximately 25 kilometers long. Within a 4,500 by 1,500-meter corridor, sampling and drilling encountered high-grade mineralization consistent with previous radiometric surveys. Initial sampling detected up to 1.81% U_3O_8 over 0.75 meters. This sample was located only 2 meters below surface.

Subsequent drilling has intersected 3,136ppm U_3O_8 over 1 meter, 2,182ppm U_3O_8 and 1,285ppm V_2O_5 over 2 meters, and 2,087ppm U_3O_8 and 1,892ppm V_2O_5 over 1 meter, all within significant uranium and vanadium mineralization up to 20 meters thick. All of these drill results were from depths up to 23 meters! Additional drilling has also returned additional high-grade results including 10,517ppm U_3O_8 over 1 metre and 8,618ppm U_3O_8 also over 1 metre, each within 8 metre intervals of over 2,200 and 2,800ppm U_3O_8 respectively. In 2018, the Company encountered over 20,000ppm U_3O_8 (equivalent to over 2%) over 1 meter, among others. This successfully confirmed the initial grades of over 1% U_3O_8! A 2019 resource estimate returned an inferred resource of 22.7 million pounds of U_3O_8 and 11.5 million pounds of V_2O_5 for Ivana.

Based on this resource estimate, an initial economic estimate for Ivana was also prepared in 2019. Based on a uranium price of US$50 per pound U_3O_8 and a vanadium price of US$15 per pound V_2O_5, the net present value (discounted at 8%) was US$135.2 million and the internal rate of return was a very good 29.3% after tax. Based on a daily mining volume of 13,000 tonnes (including overburden) and a daily processing volume of 6,400 tonnes, this results in an annual production of 1.35 million pounds of U_3O_8 and a total production of 17.5 million pounds of U_3O_8 over a life of 13 years. The initial capital cost was estimated at US$128 million and the all-in sustaining cost at US$18.27 per pound of U_3O_8. This results in a payback period of 2.4 years. This would place Ivana in the lower quartile for operating costs.

Currently, the company is working on metallurgical testing and a process design program at Ivana.

Amarillo Grande Uranium-Vanadium project: Anit

The second subproject, Anit, covers approximately 24,000 hectares and is centered between Ivana and Santa Barbara. Anit lies on a 15-kilometer trend of near surface uranium mineralization. Historical exploration work has averaged grades of 0.03% U_3O_8 and 0.075% V_2O_5 over 2.6 meters for 81 drill holes. In the western and central zones, 103 pits with uranium grades greater than 50ppm were encountered, averaging 1.97 meters of 0.04% U_3O_8 and 0.11% V_2O_5. One drilling campaign detected uranium grades up to 1,114ppm U_3O_8 and up to 3,411ppm V_2O_5. In particular, the very high-grade vanadium resource encountered attracted management interest.
Test work also showed that a large part of the existing uranium and vanadium resources can be significantly improved by so-called wet screening, since coarse gravels in particular have hardly any uranium content. This would reduce transportation and processing costs and allow simultaneous extraction from several satellite projects.

Amarillo Grande Uranium-Vanadium Project: Santa Barbara

The third subproject, Santa Barbara, is located northwest of Anit and is still in its infancy. Blue Sky Uranium has already identified several anomalies there and intends to make a new discovery soon.

Amarillo Grande Uranium-Vanadium Project: Exploration Potential and Current Work

Currently, the Company is focusing primarily on Ivana. Several anomalies have been identified in the central and northern areas of the project area. In the central area, a 6-kilometer IP survey was conducted, which was extended to over 7 kilometers due to an open chargeability anomaly in the western part. In the northern area, a 5-kilometer chargeability anomaly was seen from surface to 30 meters depth along an 8-kilometer IP survey line correlating with airborne and ground-based radiometric anomalies. Systematic sampling is underway. Previous results included 1.40% U_3O_8 over 1.10 meters, including 2.74% U_3O_8 over 0.5 meters.

The current focus of work is on target areas with significant uranium-vanadium anomalies. To this end, a 4,500-meter reverse circulation drill program commenced in February 2021 at Ivana Central & Ivana North. Work continues on permitting and project planning for exploration at the Ivana East & Cuatro targets and on engineering & process test work to support advanced technical studies of the Ivana deposit.

Grosso Group: The Game Changer

Blue Sky Uranium is part of the Grosso Group of companies. The Grosso Group is a management company that has been in business since 1993, specializing in South America, particularly Argentina, and has made 3

multi-million-ounce precious metal discoveries in Argentina alone. In addition, partnerships with commodity giants such as Barrick, Areva, Rio Tinto, Teck and Yamana have been established. Company CEO Joe Grosso was named Argentina‘s Mining Man of the Year in 2005. Grosso Group has an extensive network of industry and political contacts in Argentina. Grosso has been a director and chairman of Blue Sky Uranium since October 2017.

Summary:
Three projects, two elements, prospect of low-cost funding!

Blue Sky Uranium is a true early-stage opportunity in an emerging uranium boom market. Although the company has already made significant exploration and development progress on its three advanced projects within Amarillo Grande, two things seem objectively clear: first, the rocks at Ivana and also at Anit contain significant vanadium resources in addition to uranium, and second, the existing deposits are likely to be exploitable via surface mining. Taken together, these two factors also promise a very good chance of early production due to several existing high-grade intercepts and, above all, low-cost production that also requires only a fraction of the capital costs of similar conventional mines. With the Grosso Group, which has excellent networks in Argentina, its own production should therefore be well within the realm of possibility. The aim is to supply Argentina‘s 3 current nuclear reactors and the reactor under construction with its own uranium. With an oversubscribed financing of CA$ 5.5 million at the beginning of the year, the upcoming activities are sufficiently financed.

Exclusive interview with Nikolaos Cacos, CEO of Blue Sky Uranium

What have you and your company achieved in the past 12 months?t?

Blue Sky has a unique opportunity, Argentina is the largest generator of electricity from nuclear energy in South America. The country is working to further expand their nuclear energy sector with additional power plants, but currently lacks domestic uranium production. Argentina’s desire for security of supply could provide a “guaranteed” first customer for a new domestic supplier

Blue Sky is managed by Grosso Group, a resource-focused management group that pioneered the mineral exploration industry in Argentina. The group is credited with four exceptional mineral deposit discoveries and has a highly regarded track-record for fostering strong relationships with the communities and governments where it works.

The Company‘s 100% owned Amarillo Grande Uranium-Vanadium Project in Rio Negro Province, Argentina is a new uranium district controlled by Blue Sky. This district has the potential to rank amongst the largest uranium districts in the world, with the lowest operating cost. The Ivana deposit is the cornerstone of the project and the first part of the district for which both a Mineral Resource Estimate and a Preliminary Economic Assessment have been completed.
In 2020, due to COVID restrictions, it was a difficult year to move forward as fast as we were prepared to. But late 2020, we announced and oversubscribed a $5.5M financing and have begun a 4,500-metre drill campaign that is focussed on expanding the current mineral resource.

What are the most important catalysts for the next 6 to 12 months?

The 4,500-meter drill program is currently underway and running smoothly. We expect results from this program to be available in May. At the same time as we look to expand the resource, we also plan to move the project towards a pre-feasibility study (PFS) in the second quarter of this year. As part of the PFS, we have begun the second phase of process design tests for the Ivana deposit. The PFS will take approximately 10 months to complete and will serve as a guide for making a production decision.

How do you see the current situation on the market for uranium?

The uranium market is emerging from years in the doldrums and most reactors are coming back on line as global demand strongly picks up.
The spot price for U_3O_8 moved above US$30 per pound for the first time in 2021 as uranium producers and mine developers use up above-ground inventories and reactor construction continue at a fast pace.
A new phase of nuclear energy investment with the U.S., China and Europe leading the way recognize that nuclear has to be part of the carbon free solution for a greener world.
Price reporting agency and research company UxC estimates that utilities’ uncovered requirements would grow to 500 million lbs by 2026 and 1.4 billion lbs by 2035.
Uranium is cyclical market as with most metals and all signs are indicating we are in the early innings of bull uranium market.

ISIN: CA0960495079
WKN: A12GAR
FRA: MAL2
TSX-V: BSK

Shares outstanding: 162.1 million
Options: 16.2 million
Warrants: 95.3 million
Fully diluted: 273.6 million

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