

Uranium 202: Long-Term Contracting

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Daren: Hey, Chris.

Chris: Hey, Daren. How are you?

Daren: I'm good, thanks. I know we have been threatening to have a conversation on long-term contracting for a while, and we're finally getting around to it. This lends itself to more of a conversation than an agenda. Maybe I could kick it off by talking about a mistake I made when we first started looking at the uranium commodity, because everything in commodity-land, in our world; the way we've done things successfully in our careers—is all based on supply and demand. That's true; definitely true of uranium, but I think what I missed, or didn't fully appreciate early on was how price is set. And so, in most commodities that you and I have successfully invested in in the past, price is set in the spot market.

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Chris: Right.

Daren: And when you consider volume, volume, and demand, and consumption were all interchangeable in a traditional spot-cleared commodity market, and in uranium that's not really true. So, demand can definitely be defined as consumption, and you and I have talked a lot about that; how consumption is actually around a hundred and eighty-five million pounds a year, growing to something north of two-hundred million pounds over the next several years. But consumption doesn't really set the price, which is what I missed. Demand could be defined differently. Demand could be defined as; how many pounds are put under long-term contracts each year? So, I'll stop there, and ask you to explain; how do utilities procure their uranium if they're not procuring it in the spot market?

Chris: Yeah. Well, they sign contracts with uranium miners. The utilities go to the uranium miners, like the Cameco[s] of the world, and they put out an RFB and say, "We'd like "x" pounds per over the next five to ten years—I think the average contract life is around seven years. You know, they're looking to secure their uranium for their reactors for a period of time into the future, so I think their demand for that depends on probably their feeling about supply. If you want, we can get into the history of that going back fifteen

or twenty years, which I think kind of might shed some light on the current situation.

Daren: Yeah, let's do it.

Chris: So, back in the early 2000s, the idea was that uranium seemed fairly abundant. There was a lot of supply coming out of Russia as a result of the Clinton-Yeltsin deal; the [megatons] to megawatts deal that the United States signed with Russia that allowed Russia to down blend weapons-grade uranium and send it to the U.S. to reuse in nuclear reactors. And so, there was a fairly low level of contracting going on around the world in the early 2000s; say 2000 to 2004 I think contracting averaged sixty-five to eighty-five million pounds a year versus demand, that was almost double that under-contracting versus their annual need. And then, the price of uranium started to move up and, you know, in 2005 utilities contracted for two-hundred-fifty-two million pounds of uranium, which was a huge increase versus the previous ten years, really. And so, that caused the price to increase. And then, looking forward over the next six, seven years, all the way up to Fukushima, the average number of pounds per year, contracted, was a hundred-ninety-one million pounds per year. And so, during last time period, utilities signed a lot of contracts. Again, these are sort of five, seven, maybe even ten-year deals, so going into Fukushima, utilities were heavily contracted into the future. We estimate that they

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over-contracted versus annual demand from 2005 to 2011 by about five-hundred-fifty million pounds. Then along came Fukushima, uranium seemed plentiful again, utilities felt good about their contracting position, and from 2011 to 2019, utilities under-contracted by about that same amount, by about five hundred and fifty million pounds, according to our estimate. We think that utilities are back where they were, heading into the last uranium bull market. And one other way of looking at that is that in 2004, by our estimates, the utilities were about forty-four percent contracted for their uranium needs over the next ten years. That number, by 2008, had risen up to about sixty percent, as they signed all these contracts. In the last several years, really since 2016, that number has come down and now we think, by our estimates again, that utilities are back to exactly where they were in 2004; about forty-four percent contracted for the next ten years, which is a fairly low level, again, looking at the last twenty years.

Daren: One way to look at it is that consumption is actually very, very steady.

Chris: Right.

Daren: There's really not...If you define demand as consumption, there's no demand cycle. Demand is steady. But if you define demand as contracting

demand—how much volume are utilities putting under contract in each year? —it's extremely cyclical.

Chris: Right.

Daren: And the numbers you threw out there were going from around fifty million in the early 2000s up to two-hundred-and-fifty million in the late 2000s, and now back to the fifty-million-[pound] range. That's been really important to our thesis, to understand how that impacts price discovery. So, the way I think about it is: if they're only signing contracts for fifty million pounds of future delivery—now I'm gonna go off into a little side topic here—that fifty million pounds is delivered over a series of years. So, in two-thousand and...let's say 2017, they signed around fifty million pounds' worth of long-term contracts, right?

Chris: Right.

Daren: Give or take? That was for delivery well into the 2020s, for the most part.

Chris: Right.

Daren: So, it would be a simpler analysis if it was fifty million pounds all to be delivered in 2022, but it's spread out. So, anyway, the point being that when they go into the market and say, "Hey, we only want to

procure fifty million pounds of future delivery,” that’s actually the demand that sets the price.

Chris: Yeah.

Daren: And so, until utilities come into the market and sign long-term contracts that come closer to what their annual consumption is, the bull market probably doesn’t really get started. Now, what happens in the stock market is a different question, because the stocks could start to anticipate it, but the real fundamental change occurs when utilities feel the need to procure future delivery on volume that’s closer to consumption, which is a hundred-and-eighty-five to two-hundred million pounds, depending on which year you’re looking at.

Chris: Right.

Daren: And that’s really our thesis; is that because they’re currently at very low coverage relative to their future consumption, that’s an untenable position for them. So, a natural question would be, “Well, why are they under-contracting so much and is there catalyst that will change that?”

Chris: Yeah, I think definitely Fukushima created a lot of excess supply—or a feeling of excess supply—in the marketplace. If you’re a utility, you feel like you have a pretty good contract book over the next seven

years as a result of all that contracting leading up to Fukushima, and now you see twenty-five million pounds of demand just went away overnight; you see minimal need to contract. That's been the phenomenon for a while. And I think there also is—you know, people talk a lot about utilities being unable to sign long-term contracts above spot price. So, as a result of Fukushima and all this excess supply, the spot price went down below twenty in 2016 and has been below thirty until recently. And so, the utilities, they want to sign long-term contracts at thirty, and the miners, you know, aren't willing to do that. A lot of these contracts that the miners signed in the mid to late 2000s were at prices of sixty, seventy, eighty, some of them a hundred dollars a pound. Those contracts are now rolling off, miners have closed a lot of mines, a lot of supply is going off the market, and so the supply is not available now at thirty dollars a pound. We think that utilities are gonna need to bid higher to get that, and I think a couple recent catalysts are the big mine shutdowns by Kazakhstan and Cameco here in 2020 as a result of COVID; that has reduced mine supply this year by probably about twenty million pounds. And then another catalyst that we see is that we estimated that, you know, excess inventories coming into 2020 were maybe in the fifty-million-pound range. We thought that was gonna be drawn down by maybe about thirty million pounds. Now we think it's gonna be closer to fifty million pounds with the twenty million pounds going

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offline, and so it's our estimate that there's very little excess inventory out there now, and very little spot availability going forward. We think the utilities, you know, they've been living in a world of excess for almost ten years now, and so they think that's gonna continue—we think that's gonna be coming to a halt here. So, that's where we see a problem for these utilities in the sense that they're now under-contracted, their inventories are not high; U.S. inventories were a hundred-and-forty million pounds a couple years ago, now they're down to about a hundred, hundred-and-ten, which is about two years' worth of supply, which again, going back to previous discussions, is that...you kind of want to hold two years' worth of inventory given the time it takes to turn uranium into fuel rods. Cameco has said on their last call that they're seeing the most RFBs for uranium since Fukushima right now, so there are some signs that people are maybe trying to get out ahead of this, but those are some of the signs we see that we're getting very close to a situation where the utilities are going to start to want to come to the market again.

Daren: In some ways, it's unpredictable. You don't really know. So, if someone said, "Utilities are only going to contract for fifty million pounds in 2021; will we have a bull market?" I'd say, yeah, probably not. Probably not. But they really are only going out of the market procuring fifty million pounds—that's

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available. Because we're talking about what's available over the next ten years, and so we know that there's fifty million pounds available that's unspoken for to be delivered over the next ten years. If they wanted it all in 2024, then the answer is yeah, then the bull market will start because they'll find out that there isn't fifty million pounds available for delivery in 2024, for example. It's inherently ambiguous. But we know how much utilities still need to contract for delivery in each year of the next ten years, within a range of estimates. So, if you go year by year—and it's hard to do over a podcast; ideally, we'd be able to show viewers a table showing each year how much the global utilities consumption is still uncovered. So, let's take 2025, for example. We know that utilities are not gonna go into 2025 not knowing where their uranium's gonna come from, and so if they still need to procure forty million pounds just for 2025, they're very, very likely to do that between now and the end of 2023. They want to know where their uranium's gonna come from, they want to know where their fuel is going to come from at least two years in advance of when they're actually going to actually consume it. So, we looked at the supply situation and said, "Okay, well is there enough supply to meet that uncovered consumption?" And in any one year the answer might be, yes. But they pick away at it; as we mentioned, they're signing long-term contracts for a multi-year delivery schedule, but if you cumulate it, there's just simply not enough uranium available for

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delivery over the next ten years without shut-in supply coming back on. But even accounting for the shut-in supply, the current mines that we know about that are in care and maintenance, even accounting for them coming back online, the industry needs new mines to be developed, and that's not gonna happen without higher prices. So, it's been a fascinating industry to study. We think the supply deficit is imminent, we think it happens in the next couple years, but even if there's a supply deficit in 2027, 2028—which sounds like a lifetime away for investors—you could still have a bull market, because utilities will uncover that supply deficit through the long-term contracting process.

Chris: Yeah. I know we've talked about this before in the other podcast, but just to be clear: mine supply is...you know, we had it at a hundred-and-thirty-five million pounds this year, and falling; we know for a fact that several mines are going to shut down next year; the price is too low for a lot of these mines, and some of them have depleted their resources. So, a hundred-and-thirty-five million and falling coming out of the mines; secondary supply: thirty to thirty-five million pounds a year and also declining; demand: down a little bit this year due to COVID, but we see demand a hundred-and-ninety, a hundred-and-ninety-five, two-hundred million pounds and rising. So, you have a structural deficit that's getting bigger every year by several million pounds and starting in the thirty

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million pound a year range. And so, even if you bring back McArthur River—that's eighteen, nineteen million pounds—you're still short. And again, that's not coming back until they get contracts in the, probably, fifty-dollar range with Cameco. So, the uranium is not there, it's not there. If utilities are gonna be able to sign contracts with miners, they're going to have to pay a higher price to either induce restarts of closed mines, continuation of mines that are going to have to close because they're not profitable, and/or start up some new supply, which is going to be needed.

Daren: The supply deficit from primary and secondary supply is so obvious that we get asked, you know, "How could you be wrong?" The quick and easy answer is, "Well, there could be a demand shock like we had with Fukushima, and demand could be less than we expected."

Chris: Right.

Daren: Could that happen? Sure, but it's only happened three times in sixty years. Really, the only fundamental way we can be wrong, other than that wild card event, is if we're wrong on inventory. There's only three sources of supply. Demand is—I keep saying demand, but really...We started out the podcast saying, in this industry you really have to distinguish between consumption and demand for procurement. So, consumption is pretty visible, and so it has to come from primary supply or secondary supply, or inventory;

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and, as you just laid out, there's not enough primary supply plus secondary supply. If we're wrong, it has to come from inventory, so I would encourage people to—if you haven't already—listen to our podcast on inventory, which really lays out why we don't think there's plenty of inventory to meet this supply gap, which is why we're so bullish.

Chris: Yeah.

Daren: You know, I'm gonna pull us back into the weeds a little bit. I would argue that until this year, the utilities were comfortable with their contracted position plus the inventory that they had on hand as a global industry. And so, they didn't feel any urgency to procure their future needs. That could've changed in 2020, but in 2020 the utilities have been distracted with COVID. I mean, they had their own issues dealing with COVID to make sure they were able to operate safely and continue to operate under these new conditions, and so procuring future needs became a secondary concern. In addition, in the United States, there is the RSA, which allegedly has also been causing at least some delay in decision making. Would you mind talking about that?

Chris: Yeah, sure. The RSA, which is short for the Russian Suspension Agreement, which expires at the end of this year, that is a deal that's been in place for a while between the U.S. and Russia where Russia has been

allowed to fulfill up to twenty percent of the uranium needs of the U.S. utilities. That's ending this year, and they're working on extending or renegotiating that. That's happening between the governments. So, this is part of the utilities contract book. What we don't know is what the utilities were thinking about in terms of 2021 after this existing deal expires. There's been some talk in the marketplace that utilities have signed contracts in excess of the twenty percent number with Russian entities for 2021 and beyond. We don't know that to be true, but that would be a big deal if that is the case, and the deal is either extended at the current twenty percent level or extended at a lower level. So, that's one thing. I guess the other thing, maybe, that you were talking about, is that it just creates uncertainty in terms of utilities. They are not sure at what level they're going to be able to contract with Russian entities going forward, and so they may just be waiting to see what happens with that. So, if they're able to contract at significantly higher levels it would behoove them to wait, and if they're not, if the number's going down, maybe they also wait. So, there's been talk in the market that that's been another in the long list of things that have kept utilities sort of on the sidelines over the last two or three years. If you're a utility, you don't want to sign up for uranium that you're not sure you're gonna be able to legally receive, so those things have been overhanging the market since 2018, I guess, right?

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Daren: Yeah, I think that's right.

Chris: When Energy Fuels and UR-Energy filed that in January of 2018.

Daren: Which has been a bit frustrating, but at the end I'd still go back to the idea that they really felt good about their contracted position for the intermediate term, and so they're like, "We don't have to do anything, so we won't." But that does reach a limit, and so—

Chris: Right.

Daren: The combination of putting the Russian Suspension Agreement uncertainty behind them, the Section 232 issues behind them, and then finally they'll look at their needs for 2024 and 2025 and say, "You know what? We better know where our fuel's gonna come from, so let's start talking to people." I was gonna shift gears a little bit and ask about the U.S. election. Does it change anything from a—mostly a demand standpoint, but this is a long-term contracting topic, so...If Biden wins the election, what difference will that make to us and our thesis?

Chris: I don't see any big difference on the demand side for utilities. He, like most of the Democratic candidates, in the end ended up signing off on, you know, being in favor of nuclear, at least for the

intermediate term, meaning ten plus years. Because over the past several years we've seen a lot of the Green movement embrace nuclear for a source of large-scale power which does not emit a lot of CO2. So, all this stuff that Biden has said regarding this is that...there's not gonna be any effect on demand for uranium going forward from, from the utility side. It's possible there might be some tighter regulations of the miners, but that probably would not have a huge effect even on the profitability of the miners.

Daren: I think it made sense that if you're running a utility, and you think that there's a political party that is more hostile towards your nuclear power plants, then you're not going to lock in future supply for ten years. I think if you go back several election cycles, that's been the case. I think election outcomes probably did impact how far out utilities were willing to secure their fuel needs. But it does seem, as you pointed out, that both parties are embracing nuclear power; maybe for different reasons, but that'd doesn't really matter to us, and so I think the utility executives will be more willing to secure their fuel needs here in the United States going out several years.

Chris: Yeah. Yeah, I think you're right about that. So, I think all of that—again, as part of nuclear being embraced, as part of the Green movement—it will probably give utilities a lot more confidence about

probably the next ten years, at least, no matter which party is in charge.

Daren: Right. Alright, Chris, I wanted to do a very quick conversation on Kazatomprom's announcement about 2022 production. Every year, about the middle of the year, they will give an intermediate term outlook for production, and a few days ago they announced that 2022 production will be flat again. So, relative to what they could produce, it's twenty percent less than what they could produce. Obviously, they're the eight-hundred-pound gorilla, with forty percent share of production in Kazakhstan, so it's always big news when they talk about production. So, what's our take on their 2022 plans?

Chris: It seems to me sort of a classic commodity-producer playbook; they don't want to sell their finite, limited resource at a price that they think is below what the long-term economic price should be. Now, they're the low-cost producer, so they could still make money at, say, thirty-five or forty dollars a pound, but I think they're looking at it and saying, "We have limited amounts of uranium," they are producing at a high level—fifty-five million pounds a year—but still, those pounds will run out over the next ten years, and so I think they're looking at the market just the same way Cameco did, and saying, "Why should we be putting pounds into the market at a price that's below the long-term marginal economics of the



market?" So, we think that's sixty-five dollars; they're probably looking at the same charts we are and saying, "We're not sellers at thirty-five."

Daren: And it could be related to our conversation on long-term contracting, too. If they had those pounds under long-term contracts, maybe they'd be more willing to produce them, but they don't, let alone at the prices that are attractive.

Chris: Right. I guess there's another possibility, and it be that it could potentially be difficult for them to ramp that production up. I mean, Kazatomprom has had a tremendous track record of ramping production up from 2005 to now from...I think it was five million pounds a year to fifty-five million pounds a year. You know, that's a lot of production, and the seventy million pounds that they have talked about being able to produce is an agreement—a sub-soil use agreement that they have with the government. Certainly, it's possible that they could do that; it also might be possible that it could be difficult to continue to ramp that production up from fifty-five to seventy million pounds a year. We don't know. There may be issues around labor, or even depletion of existing assets; existing mines do deplete, so you have to produce more elsewhere to stay at the same pace. So, you know, that's another possibility, that maybe it was always gonna be difficult for them to really ramp

that up and maybe they're just saying, "Certainly, we don't want to do that at thirty-five dollars a pound."

Daren: Right. Yeah, I guess the marginal cost, presumably, would just continue to go up, even for a low-cost producer like them. What you just described—you know, we've heard that over the course of our careers about Saudi Arabia. Saudi Arabia, supposedly, could easily ramp up to twelve million barrels a day, if not more—that's what they claim—yet they've never really done it, and so there's a lot of skepticism of whether they're capable of doing it ever. So, maybe Kazatomprom's not capable of getting to seventy million pounds. But I actually thought you were gonna go a different direction; there's some chatter that the impact of COVID and their lack of well head development in 2020 could impact them through 2021 and 2022. So, again, even if they wanted to get to seventy million pounds per year, this lack of development may have made that impossible. Basically, they're saying, given the characteristics of ISR mining and the characteristics of their resources, that this delay could really be costly to them in terms of production capacity, which is—

Chris: Yeah.

Daren: Interesting.

Chris: Yeah, no that's definitely...You're right, that's

certainly another possibility. You know, we know that it's going to affect them into 2021 for sure, and then it's certainly possible that it could go beyond that, as well. That's a third possibility.

Daren: I feel intellectually obligated to address the claim we made when we updated people on Cameco and Kazatomprom's decision to reopen here in the near term. They're hoping to be up and running again by September; and Kazatomprom, with well development, and for Cameco, getting Cigar Lake up and running again. And we took that as a bullish sign. We said, with the caveat that we might be suffering from confirmation bias, we said, "Hey, these management teams might be seeing a supply deficit, and that's why they're eager to restart, because they see a supply deficit." But then, two weeks later, Kazatomprom says, "Hey, 2022 production is going to be lower than it could be," which at first pass it contradicts our claim that maybe we were seeing bullish signs because of the reopenings. So, after some contortions we squared that, too. Again, with the caveat [that] maybe everything is confirmation bias, but there actually is a logical explanation for why both things could be true. Do you want to take a crack at that?

Chris: Yeah. It is possible that Kazatomprom and Cameco have contracts that they need to fulfill in the next eighteen months that they don't have the ability to do so if they don't ramp production back up. Then they

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may not—in Kazatomprom’s case, they may not have contracts that would require them to ramp up to their sub-soil use agreement number of seventy million pounds a year in 2022. So, it is possible that you have a near-term shortage without a need to ramp up further in 2022.

Daren: Right. That’s well said. To maybe just put a finer point on it: another way to look at it is neither management team wanted to rely on the spot market to fulfill their contracts over the next twelve to eighteen months, which is what they would have to do if they didn’t take the actions that they did to restart. And they looked at the spot market and said, “We can’t do that.” And Kazatomprom in particular had really shut down, and they need to reinvest. It’s...with the ISR manufacturing process they have to keep things going. It’s more of a manufacturing process, whereas Cigar Lake, they can basically go underground and start mining right away. So, anyway, we’ll see. I mean, I guess, in the end, we didn’t expect those mines to be offline anyway, as part of our bullish case, so the fact that they’re restarting doesn’t change our outlook in 2021 and beyond. And actually, in our supply model we were assuming that Kazatomprom was going to stay pretty flat unless prices recovered, anyway, because they’ve said publicly several times now that they are pursuing a value-over-volume strategy.

Chris: Right.

Daren: So, their 2022 production announcement really just confirmed what we were already thinking. So, it's not incrementally bullish relative to our model, but it's definitely incrementally bullish relative to the industry's model.

Chris: Yeah. And in the big picture it sort of just confirms our theory that if utilities want more pounds, they have to pay more. So, I think that's kind of what Kazatomprom's saying here: "We're not ramping up at all until the price goes higher," which is what Cameco's also telling you with their pronouncement about McArthur River.

Daren: Okay, well I think that hits on every topic that's related to long-term contracting. To summarize our conversation, here: Really, the price of uranium is set through private negotiations between utilities and miners, and there are other steps between mining uranium and turning it into fuel that have to be negotiated, but the point being; price is set through a series of privately negotiated futures contracts for delivery up to ten years out. And until demand for those future deliveries comes closer to consumption—that hundred-and-fifty to a hundred-and-seventy-five-million-pound range—the industry won't discover that there's not enough supply to meet that demand. And we believe that we're at the cusp of an upturn in the

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cycle for long-term contracting volume, that it's been too low for too long, and that the low levels of long-term contracting volume of the last six or seven years have really put the utilities into a position where their future consumption is relatively uncovered. It's at a new cyclical low, if you look at the last twenty years. And so, we're probably, in our opinion, at the cusp of what would be considered a long-term contracting cycle that should start next year, according to our estimates. That's when you'll have true price discovery. Is there really enough uranium in the world for delivery in the mid 2020s, let alone the late 2020s? And we're convinced that there's not, and when the industry discovers that, then it will be somewhat of a mad scramble to both procure physical uranium, but also develop the mines that have to be developed to meet consumption needs. So, with that, maybe we'll sign off and welcome any questions or feedbacks. Thanks, Chris, I appreciate your time.

Chris: Yeah, as always, it's good to talk to you, and...yeah, the mad scramble is likely soon.