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A Defense Perspective on A Reliable and Sustainable Supply of Critical Minerals

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CANADA-UNITED STATES LAW INSTITUTE 2022 EXPERTS' MEETING: A DEFENSE PERSPECTIVE ON A RELIABLE AND SUSTAINABLE SUPPLY OF CRITICAL MINERALS

The following is a transcript of the Canada-U.S. Law Institute's Nov. 2022 Experts' Roundtable held in Washington, D.C. The Roundtable focused on the supply of critical minerals in the Canada-U.S. trade relationship.

Mr. STEPHEN PETRAS: First of all, I would like to start off with a big round of thanks to Cleveland Cliffs and James Grant, who have provided us this wonderful lunch. So, thank you. Very nice to have the support of James and Cleveland Cliffs.

Now, we're at the luncheon program, and for our speaker, we are very fortunate to have Mathew Zolnowski, who serves as a highly qualified expert and portfolio manager in defence production and Title 3 program at the Department of Defence. Ms. Zolnowski joined the Department in the summer of 2019, leading analytical work on critical minerals, supply chains, and the Department of Defence's policy on tariffs and international trade. In March of 2020 – you can understand why, during that period of time – they took this highly talented individual, and decided to put him in charge of their healthcare portfolio and response to the Pandemic. In this role, he oversaw 200,000,000 in projects supporting the N95 respirator, swab test kit, and syringe manufacture. After the propagation of Executive Order 14017, Mr. Zolnowski led the inter-agency reporting exercise in critical minerals, and in close coordination with the White House, he guided the development of the presidential determination to support sustainable development of domestic mining, beneficiation, and value-added processing of critical minerals for large capacity (UNKNOWN). He now manages the deployment of over \$750,000,000 from the *Inflation Reduction Act*, and the *Ukraine Supplemental Appropriations* law to support domestic critical mineral investment. And he's here today to talk to us about the Department of Defence, and the challenges of critical minerals. Matt.

Mr. MATHEW ZOLNOWSKI: First, Steve, thank you very much for the kind introduction, and similarly, I'd like to thank the U.S./Canada Law Institute, the Wilson Center for the invitation to speak after our distinguished guests this morning. In my remarks this afternoon, I have deliberately decided to break from Department of Defence tradition, by denying you the single pleasure of a fifty slide PowerPoint, and instead I would like (to speak to you about) strategic and critical materials, and how we are approaching risk management for the defense in the essential security and industrial base.

Critical materials – or in DOD speak, strategic and critical materials – are the building blocks of the thriving economy and a strong national defence. They can be found in nearly every electronic device, from personal computers to our appliances, and they support high-wage jobs in the mining and chemical processing industry as well as production of high-value goods in fast-growth markets like the (UNKNOWN). Strategic and critical materials also enable the conventional and strategic overmatch of the U.S. Armed Forces and those of our allies and partners. Taking a page from history, industrialized nations that do not have secured, reliable access to these materials at war time have suffered significant performance trade-offs, which have contributed to their defeat. In sum, strategic and critical materials touch almost every facet of our daily life; and the opportunities and challenges in this sector, for the private sector and for governments, are a microcosm of the geopolitical and geoeconomic challenges and competition that are shaping the twenty first century.

Now, sitting as we are in November of 2022, we might be tempted to look at the COVID-19 Pandemic as the inflection point that has dried the industry, the U.S. Government, and the others to shore up our supply chains. Yes, COVID-19 is important. Every company in this room has grappled with the Pandemic in one, or, more likely several, ways at once; be it limitations on travel, compounding logistics constraints, or facility closures. And this says nothing about the personal toll the COVID-19 pandemic has extracted from each one of us in the form of cancelled weddings, missed birthdays, and unfortunately, the empty chair at the kitchen table. As important as the shared COVID-19 experience will be, it's worth observing that COVID-19 did not create fragility in global supply chains. Rather, it's highlighted the fragility that has been built in for several decades as all industrialized nations shifted towards lean, just-in-time supply chains. COVID-19 is simply the most recent shock in a long series of disruptions that have been increasing in frequency and severity over the past decade, to the point the new normal for C-Suite supply chain risk management now includes proactive auditing through sub-tier suppliers for child and forced labor, preparedness for extreme weather events, constant defence against cyber-intrusion or ransomware by pure amateurs or state-backed hackers, and much more. At the Department of Defence, and in our shop, the Office of the Assistant Secretary of Defence for Industrialized Policy, a core mission is clear-eyed analysis of the risks of global supply chains and developing risk-mitigation plans around them. With that in mind, the global supply chains on which DOD and commercial markets rely for critical materials have brought significant benefits, and in the DOD's case, a material benefit has tightened our alliances and security partnerships abroad. To give just one example, we've purchased many of our critical chemicals from our NATO allies to produce (UNSURE) bombs. We also procure rare elements from Australia, Japan, and Germany to produce gasoline and electric motors. Our foreign partners also helped us to fill in the gaps in our domestic supply chains; the United States binds zinc in Alaska, which is subsequently refined in British Columbia in Canada to produce purified zinc and germanium compounds. These compounds then move back to the United States and to our European allies, where they ultimately produce infrared optics and satellite solar cells on defence platforms.

On the other hand, U.S. competitors are also working to turn our global engagement into a vulnerability, and they actively intervene in markets to capture valued gems; often working both ends of that chain, such as mineral processing and the origin supermarket, against the middle. Or, to borrow a quote from then-Deputy Director of Intelligence Robert Gates in his 1984 remarks at the National Defence University to the National Strategic Materials and Minerals Advisory Committee: ‘My concern is that as production of these materials increases in part through foreign government support, foreign competitors may build up enough capacity to discourage U.S. firms from moving into these areas. And if this happens, the relevant production technology for military applications may never be established domestically without expansive Defence Department programs.’ The administration has taken a very clear position in its national security strategy that the United States relies on the fair and open trade and international economic system; however, longstanding rules that govern international trade have been violated by non-market governments, such as the People’s Republic of China. And so, the United States must rally our partners around rules that create a level playing field to enable broad-based economic growth and prosperity. For DOD’s part, China remains our most consequential strategic competitor. It is the only country with the intent, and increasingly the capability, to reshape the international system. We will continue to prioritize the defence of homeland, deterring strategic attack, building a resilient joint force and deterring aggression, while being prepared to prevail in conflict when necessary.

I would like to pause on this latter part, because it truly is the fundamental question that drives our posture on strategic critical materials: namely, if we were called upon to execute the national defence strategy, are we ready? Thankfully, the Department has a robust, data-driven process to answer this very question through our National Defence Stockpile Program. Every two years, our stockpile economists and engineers canvas industry, the military services, and our non-defence agency partners, such as the Department of Commerce, Energy, Interior, and many others, to identify materials properly and that painstakingly collect the data that is necessary to build forecasts for those material markets. Our non-defence agency partners are critical to this effort, and we also have highly prized collaboration with industry, foreign and domestic, to process those business proprietary data, and show how the territory of the day-to-day market departs from the map for international trade statistics. For those in industry that do work with us on this effort, I’d like to express my thanks, and similarly, I would like to open the door for any other companies that are interested in working with us on this project. Taking a step back to this process, with then perturb our market forecasts with the unique conditions of the wartime scenario to produce estimated shortfalls of defence and essential stability needs. We report these results to commerce every two years, and the next one is scheduled to be delivered in January of ‘23. As you would imagine, this portion of our work is in black box, at least to the outside world; but what I would offer is that we once again rely on critical inputs from numerous stakeholders from across the joint staff, the Office of the Secretary of Defence, the intelligence community, again to appropriately capture the work we have done. That said, the 100-day report on critical materials under section order

14017 has offered a glimpse behind this curtain. In that report, we have 53 materials that have unclassified shortfalls to defence or essential civilian needs. During the postulated national emergency conditions of this scenario, the United States is likely to face inadequate supply of these materials due to an inability to access foreign sources, among other factors.

I will not belabor the point in listing every single material that is in shortfall, but, reduce it to its simplest as they span the alphabet – from aluminum to yttrium, as well as a myriad of product forms, be it stable isotopes, raw ores refined metals, and chemicals. For the vast majority of these materials, the DOD is a very small consumer of critical materials relative to the U.S. civilian market demand. This civilian-centric nature of the challenge drives us towards an all-of-the above approach, in which we leverage the unique capabilities of every component of the Federal Government to bring to bear.

To that point, we highlighted four key pillars, which nest under the industrial strategy that Ms. Fazili outlined in her remarks earlier today. One, to drive demand; we must develop and foster new sustainability standards for critical material-intensive industries. Second, to stimulate supply; we must expand sustainable production and processing to include recycling and non-traditional mining practices. Third, to hedge risk; we must strengthen U.S. stockpiles. And last, to promote equity; we must work with our allies and partners to increase traceability and transparency in global supply chains. Our core recommendation for this report is the development of sustainability standards for critical materials and putting these standards into federal procurement practices. Just as organic food labelling created market space for higher margin produce, sustainability standards are meant to catalyze the burgeoning market force for responsible investing and ESG standards in general. I'm happy to note to this audience that the U.S. Government is already on path to implementation of these standards. To give just one example, through the Environmental Protection Agency's leadership, new criteria for the sustainable use of resources under the EP eco-label for consumer electronics. To ensure that we have a reliable source of critical materials, we will also need to consider stockpiling what we will need to take on an emergency. Some of this means new resources, but a more significant portion means dusting off some of our longstanding authorities to procure critical materials to create the time that our industrial base needs to mobilize and respond to a national emergency. Again, I am happy to report that the President signed an executive order that will streamline our ability to release materials from the stockpile in the event of an emergency, and this Congress has made the first direct appropriation to a national defence stockpile since the end of the Cold War. Now, as is common sense to this audience, critical material markets aren't equal, and facts, or in this case geology, is a stubborn thing. This reality compels us to work with our allies to develop sustainable sources of critical materials to ensure that these materials are produced, processed, and recycled in a manner that supports the ability of all countries to realize the full economic benefits of their geologic endowment. Our colleagues at the Department of State, through the Mineral Security Partnership, have been doing incredible work in this space, and the receptivity from our allies and partners across the board has been both positive and very well-received.

Lastly, I'd like to offer a few words on the supply side of the question - or, as Steve pointed out, the \$750,000,000 DPA Title 3 question. In short, we are under no illusions about the competing pressures that are facing incumbent producers, nascent junior miners and explorers, and downstream manufacturers. We are also under no illusions about the scale of the challenge we face, as well as our investment partners in the Department of Energy, the Export-Import Bank, [UNKNOWN] among others. As such, our approach to critical minerals is one of a patient, strategic investment. Wherever you are in the development side be it preliminary economic assessment, PEA, feasibility study, we want to work with you to accelerate the transition from the lowest cost technically acceptable sourcing to one that reflects our values and brings resilience to critical materials supply chains. I am happy to talk to our investment approach and strategy more generally during Q & A. Going forward, Americans, our allies, and our trading partners have never been so confident about our supply chain future. Our industry needs the world of innovation and production, for entrepreneurs and small businesses, power and unrivaled capacity to create everything from cars and satellites, to airplanes and industrial robots. The U.S. Military, in combination with our allies, is the most powerful in the world. Our capacity to create value for consumers in unrivaled, especially when we work together. For Americans, perhaps the most powerful tool in our arsenal is that the entire country is united in our commitment to this task; there is bipartisan, bicameral, and broad interagency consensus on the need to build resilient supply chains; and we are committed to working at home and abroad to ensure that we have the leading edge capabilities needed to support the defense industrial base and broad-based economic growth. A comprehensive strategic approach to address supply chain resilience will take time, take innovation, and resources, and yes, we are working to solve the problem that to many decades to evolve. But the actions that the administration has taken to date are a significant down payment towards accomplishing those goals. Thank you again for allowing me to speak with you this afternoon, and I look forward to your questions.

Mr. PETRAS: Thank you, Matt. Please, don't leave the podium. So, Ladies and gentlemen, the questions for you speaker. Yes, in the back.

Mr. JOHN GALLAGHER: Hi, John Gallagher. Sorry if I missed, maybe, part of your remarks, and you addressed this. But I'm listening to what Minister Champagne was saying, even in the last week, in Canada, the Deputy Prime Minister, everyone here, some of our speakers talked about it. It's Canada really identifying itself as they're ready to be a global leader in this area. How seamless can we be in working with them across North America, so that authorizations and funding and the Defence Production Act and other things we saw - we saw some money go to MP materials, for example - when I hear President Biden say domestic sources are rare birds for climate reasons, and countering everybody else, I want that word 'domestic' to cover Canada and the United States. How true is that?

Mr. ZOLNOWSKI: Well, it's really quite simple; it's a matter of law, settled law. Since 1992, Canada has been considered a domestic source of the Defense Production Act. So, and investment in Alberta or Quebec or Nova Scotia would

be no different than those in Nebraska or anywhere else in the United States. So, as a matter of law, that's absolutely, just a reality. To your point though, many of the companies that we are working with on critical materials issue have never done business with the U.S. Federal Government before, American or Canadian, and quite frankly, if we want those companies to participate in the government process, be it the TPA program or any others, we have to come to them. So, as I'm sure some folks from the Canadian Embassy and some of our Department of Commerce colleagues can note, we're participated by way of webinars with Canadian industry through the MSP Program, the Canadians and many other partners have signaled priority projects that we should consider. And so, we are actively engaging those firms, trying to bring them into the process and educate them on just how do you consider a TPA investment – or any other – and is it the right fit for who you are as a company and where you're trying to go. So, the short answer is, it's a duck on a pond; looks very quiet on the surface, but there's a lot happening.

UNIDENTIFIED SPEAKER: Actually, a follow-up, we were chatting about the before lunch. But there's misnomer specific in Canada – so we have a Canadian Embassy project, you know, we look at this as an opportunity to, you know, find funding and secure our commercialization path. But, the misnomer is that, if you were to provide funding under this, the Defence Production Act, that that material would be going into defence, so it would just end up in something that might be used in the military. And from an investor point of view – and this is who owns our company, we're publicly traded – there will be concerns potentially among them. So, I understand now that that's a misnomer for the most part anyway, so maybe just touch on why the Act is there, and what it's actually meant to do – it's not necessarily what Canadians are perceiving it as.

Mr. ZOLNOWSKI: Sure. So, first thing's first: with the duck in a pond reference, I just want to make sure it's abundantly clear – I did steal that from the movie 'The Replacements', so that's not created. But when it comes to this consideration, the key - when the word 'defence' is in the Defence Production Act, it immediately triggers folks to think 'ah, this must mean the U.S. Military and the U.S. Military are involved'. That's partially it, because the way the Defence Production Act works, it's about a shortfall to national defence, and to dive into a bit of extreme legalese, there's two different bodies of law that govern the way the Department of Defence functions: Title 10, and Title 50. Title 10 is exclusively the body of law that deals with military activities – US Army, US Navy, etc. Title 50 is [UNKNOWN]. And so, in that sense, are there military contingencies that fall into Title 50? Yes, absolutely. Are there non-defence contingencies that fall into Title 50, like a pandemic? Also, yes. And so, specific to [UNKNOWN], the shortfalls we are looking at are related to not just the Defence Department's need for resilient supplies of lithium, nickel, and cobalt, etc., batteries that we purchase; it's also about essential civilian industry. If you think about the role of these batteries in transportation and green storage, the impact on the U.S. economy is massive. And so, we need to have a resilient supply chain. Again, not just for military purposes, but for the broader civilian economy. And so, that's why the DPA is an incredibly flexible instrument to get after not only hard defence requirements, but again, essential civil needs as well.

UNIDENTIFIED SPEAKER: I think last year, the last version of the NDAA which passed the House – has included some provision to have aluminum added to a special category for the DOD, and then in addition to that, I think another section of that bill had looked to have aluminum have a specific DOD or DPA Title 3 usage. And I'm just curious if you think that's something that congress is going to move forward with? Do you think that's necessary? I've noticed that aluminum is very much needed for a lot military uses.

Mr. ZOLNOWSKI: Sure. So, just very briefly, I believe the special category you're referring to is a proposal to have aluminum add to what's called the 'special metals' clause. The 'special metals' clause, just describing the group, is a requirement that this class of metals and alloys be melted or produced in the United States or a qualified country. And a 'qualified country' includes most NATO allies and several other key allies in the Asian Pacific – like Australia or Japan, for instance. It was proposed; it was ultimately not included in the NDAA, so that's not what I can kind of speak to why that was not the case. I was certainly tracking that development. In terms of a requirement for aluminum under DPA Title 3, we do have a reporting requirement on that area subject which is making its way to Capitol Hill right now. And to your point; not all aluminum is created equally. There's a difference between just typical London Metals Exchange P-1020 aluminum, high purity aluminum, as well as the specialized aluminum alloys that are used for military purposes, and so on. It's not as simple as saying 'aluminum is great for the country'; you really have to break the issue down to the specific product.

UNIDENTIFIED SPEAKER: Early on in the NDAA this past year there were efforts to expand work into Australia and the UK as well; where does that stand? From a company that we work with in the Indo-Pacific, we would love to see it, but very curious where it stands.

Mr. ZOLNOWSKI: So, that language is still pending in the Congress, and the Defence Authorization Bill for the fiscal year '23. So, now that the elections are over, I presume that Congress will come back to both the NDAA and our appropriation cycle for this year, so, ultimately, it's still in their court to make a decision on where that proposal goes.

UNIDENTIFIED SPEAKER: We've worked with your agency lab, we appreciate all your work. You mentioned that aluminum, much like aluminum steel, has very unique products that serve the military in particular [UNKNOWN]. But I wanted to ask; you mentioned the DPA and [UNKNOWN]. Can you provide a little more color on what the path forward looks like, and if you'd need more authorization from Congress, or what the next steps are, you know, if you have funding and will be seeking our proposals, or sort of how that works under the authority that was give [UNKNOWN]?

Mr. ZOLNOWSKI: Sure. So, I'll take it in two rounds. So first, when it comes to GOES, as a product in particular; independent of the defence production maps, and in addition to that DPA expansion revision, one of the other revisions that is also currently pending before Congress is to give our stockpile the authority to buy materials for their inventory. One of those materials is grain-oriented electrical steel. So, we are certainly hopeful that that should come to pass. In terms of the

defense production map itself, I'd certainly be happy to follow-up offline to give this a little more detail to anyone in the group. But reduced to its simplest, the way our acquisition vehicle is set up, we can do two things simultaneously. One of them is the typical government procurement process; we issue a request for information or request for proposals, we tell you exactly what we want, when we want it, and how much money we have, and it's very much a rote process, for lack of a better way of putting it. It's not that difference from any other government or public procurement process you would [UNKNOWN]. On the other hand, our contracting vehicle also allows for companies to submit an unsolicited white paper at any time and on any subject, again, the intent being that, you know, for all the wisdom of the federal government, we don't actually know all of our requirements at any the time; and sometimes, market conditions are shifting so quickly, that if we were to follow this rote government procurement process, we would never actually be capable of responding to the crisis in time. And, really, this white paper process completely puts the initiative in the hands of industry to come to us and say: 'I found this problem, here's how I think we can solve it, and here's roughly how much I think it costs.' And when you submit that white paper, that is sufficient for us to basically do one of four things. One, we can read it and say, 'no, we don't want to do this', and completely reject it. Another option is we can look at it and say: 'hey, we really like this thing, there's technical merit here, but we don't have enough money for it right now,' and that's usually a trigger for us to go to Congress to get the money we need. The next two options are going down the important path. So, 99% of white papers, we will look at them and say, 'this is really good, but -insert thing here-'; either we want to do additional diligence, or perhaps the scope of work isn't as well defined as we want it to be, but something needs to be addressed. In that circumstance, we give that technical feedback to the company, and we invite them to submit in detail [UNKNOWN]. And that's very much a normal 50-plus page document – you've got vendor quotes, and all that. Total time when you go down that path is approximately 6-9 months. On the other hand, there are occasions where two things happen; this is the fourth path, which again, I'm going to preface this with every company wants this, but less than 1% are going to get this one. And that is the initial white paper that comes in is sufficiently well-defined that we could write a contract immediately based on just what you described in your initial offer. The second thing that happens is that based on what you identify, there's an urgent and compelling need that we must work against this right now; and in that circumstance, we can get on contract withing 30 calendar days. During the Pandemic, our course record was six days; again, that process from initial submission of the company to money in their pocket. Again, everybody in the industry will want a six-day turnaround, but again, it's as much on the company putting forward a no-kidding offer that [UNKNOWN], as well as is there truly and exigent need for the government to act immediately. So, things like N95s, things like swabs – you know, things of that nature – would rise to the level of: we must go forth and do that now. But those are, again, the five-paragraph essay response. All the potential options to engage in the Title III program, we'll be happy to distribute basically some how-to guides for anyone who's attended here today.

Mr. LARRY HERMAN: I thought I would just mention that our relationship with the United States, in terms of trade, is governed by the new NAFTA, or the Canada-U.S.-Mexico Agreement. And that covers things like tariffs, and goods between the countries. On the defence side, those are not covered by the Canada-U.S.-Mexico trade agreement; they're covered by defence-sharing arrangements. In the Second World War, Canada and the United States included arrangements; they weren't treaties, they weren't agreements, they weren't approved by Congress, they were defence production sharing arrangements, which continue to this day. And so, when a company is qualified under those arrangements, whether it's under the U.S. Defence Production Act or the Canadian Controlled Goods Act, those companies qualified goods in the defence sector can be exchanged between Canada and the United States free of duties, free of tariffs, and basically means duty-free trade for qualifying projects and qualifying companies in the defence production area. I just thought I would mention that. It's a very important framework for bilateral cooperation and collaboration between our two countries that, frankly, from experts like yourself, isn't often discussed and probably not appreciated enough. But this is an important area where the two countries – not three countries, as you have in the Canada-U.S. Mexico Agreement, but our two countries – collaborate very closely in the defence production sharing arrangement. I just thought I'd mention that.

Mr. ZOLNOWSKI: The only comment I have on top of that is, again, also through our office, not in my section in particular, we have our own security and supply arrangements. One of the things that our security and supply arrangements allow is that, when you have priority-rated orders under the Defence Production Act, our security and supply partners in Canada, Italy, and a handful of other countries, they can access the U.S. market on a priority basis, and then similarly, we have access to their markets on a priority basis to meet national defence needs. So, short answer is you are absolutely correct, that is an incredibly important tool. If I remember correctly, the agreement between the U.S. and Canada actually dates back to World War Two, if I am correct– it's gone through a couple of different iterations since then, it's now part of the Defence Production Act, but that would have been well before DPA was the law, since I was a kid.

Mr. HERMAN: It actually originated at Hyde Park, New York, when President Roosevelt and Prime Minister Mackenzie King met, and that was the origin of this pre-trade security arrangement, the defence production arrangement, between Canada and the United States. I think it was 1942 that those arrangements started. A little bit of trivia.

Dr. STERN: I'm going to ask a question that you might have [UNKNOWN], but I'll ask it anyhow. Pursuant to the export control announcement on semi-conductors, one of the topics that everyone's speculated on it: is how will China retaliate? If they retaliate. As defence planners, I can imagine that you're spending some time over at the Pentagon thinking about critical minerals that we have access to from China. So, could you address that in any way and in as much depth as you feel comfortable?

Mr. ZOLNOWSKI: Sure. What I would have offered is, to that, in my remarks I talked about our stockpile plan process. One of the key pieces of that analysis,

again, is to try to assess what would have been the marketplace simply as a matter of baseline conditions, and then thinking about in a specific wartime contingency, how are different countries likely to act? That can be both belligerent parties, neutral nations, and non-belligerents. So, it's part of a routine assessment and planning process that we do every two years.

Dr. STERN: And where are we on it now, in regards to any contingency that might happen to China will retaliate on some critical metals?

Mr. ZOLNOWSKI: So, I'll politely defer the question.

Mr. ALEX PANETTA: Hi, I'm from the Canadian Broadcasting Corporation, so the media, full disclosure. So, just had a few questions about funding models. So, one of the funding models you're keenest on pursuing in potential cross-border partnerships – we're talking grants, loans, purchase agreements, and so, yeah what sort of time frame are you looking at for potentially getting some of these projects going?

Mr. ZOLNOWSKI: Sure. So, the principle instrument that we are offering, the best way to analogize them, we call it grants – so, they're not offering loans or loan guarantees, so, that's the first piece. But that stems from the fact that when the President gave us his authorization for better materials, he authorized grants and contracts, he did not authorize loans, so that's pretty straightforward. In terms of the availability of companies to apply for assistance, the way our procuring process is set up is that we have one perpetually open contract in the vehicle. And the intent is: this vehicle is always open, so that way, no matter what's happening in the world, there's a single landing point for all defence production investments – doesn't matter if it's submarines, hypersonic weapons, N95s, or critical materials, they all go to a single landing spot, which we're distributed to our Canadian Government colleagues and many others to try to shepherd industry to that locale. In terms of the types of things we're interested in, we have released some procurement guidance – I believe at the end of May – that outlined five key areas of groundwork. And again, this is synchronized both in time, in terms of when we are looking for supply to arrive in the system, as well as, frankly, the kinds of companies we're looking for. What I'd say about the time is there are a handful of opportunities in industry to get new supply into the system in the short term – the short term being between now and 2025. At the same time, if the demand for these materials is as advertised, that's not going to be enough. We need to start making those we're calling 'condition-setting investments' today, so that way the next generation of projects in 2026 and beyond are ready to go. So, part of our challenge is to make sure that we're doing the satisfying thing of getting stuff built and doing it now, versus 'I have to do the front-end of engineering and design work to actually get ready the project ready'.

So, there's five things that we want to work on. The first one is bankable or definitive feasibility studies. Again, the life of the money project is a PEA - preliminary economic assessment – a pre-feasibility study, and a bankable feasibility study. It's pretty well known that the winnowing effects at each of these stages, and especially getting into production, is pretty extreme; it's very, very significant. And in some cases, you have very good projects that by the time they get ready for the bankable feasibility study phase, they're sufficiently leveraged

up that they just can't get that last big capital to do the final engineering study to get then into production. And so, that's what the first piece is designed for. It's really for the juniors, the mature juniors, to get them across the hall and get them into production. The next three bits are really more designed for some more mature mining companies. The first one is - again, Ms. Fazili mentioned this up front - [UNKNOWN] extraction. There may be existing mine projects out there today - say it's a boron primary, but they have some lithium in their tailings or waste rock - where, again, it's [UNKNOWN] to an existing facility with existing compartments, with an existing management team, and existing cash flows. Again, it just drives the risk into the ground as a project. But again, that's driven by geology, so there's only going to be so many projects where you can do that. The next part we're calling facility modernization. So, it means the obvious things: how do I improve my flow sheet, and I use less water, less power, things of that nature. But it also means what we're calling transformational changes in the mining process. So, there's fascinating developments happening in the mining community with the integration of battery electric vehicles, or fuel celled-powered vehicles with autonomous systems, and the amount of productivity you can gain from doing that, either for significantly expanding or improving productivity or operations, reducing carry-back at your mine site - really fascinating things like that. So again, it's trying to get more out of the resources that we have. The next piece is recycling. Again, this is a priority area, not as large - not because recycling is not important, but just in light that the Department of Energy has a lot more money than we do. The bipartisan infrastructure law gave them over \$7 billion to invest in the battery sector, including recycling, and I kind of shudder to say that we only have \$750 million. So, there are very good projects out there that aren't as capital intensive, and so we will be pursuing those. It's just that we know that mining and mineral processing is a power core element, so that's what we focused on. The last one that I'll refer to is really a key lesson learned from the pandemic: which is, if all of this build-up in the mining sector is going to occur, that is going to create rippling stress through other sub-tier suppliers of the supply chain. And it's going to be things like getting diamond-core drill bits, it's going to be things like getting field service support, it's going to be workforce; are we actually training enough chemical engineers and mechanical engineers and mineral economists to actually do the work that needs doing. And especially if you think about workforce, let's assume, for argument's sake, it takes four years to get somebody through college, another two years to actually get good at the job - because they don't come out of school and just know what to do right away - that means that if we start right now, that first wave of people won't be ready until 2028 or later. So, that's a perfect example of a condition-setting investment that you do now, fully noted that it's not going to pay off for several years, but if you don't do it, you'll never catch up to the demand curve. [UNKNOWN], but if you want, it's actually publicly available, that procurement guidance, it's also on our policy website as well, so happy to distribute that to the group as well so everybody can read that.

Mr. PETRAS: Thank you, that was fabulous. One small question before we leave today is we've got Jim Blanchard here, former Governor of Michigan,

former U.S. Ambassador to Canada, and traditionally, a commentator to the Canada-United States Law Institute on what election results mean to us. So, three minutes, Jim; what can you tell us?

THE HONORABLE JIM BLANCHARD: As a Democrat, I'm happy.

The election results surprised everyone; nobody expected it, but they knew what was going to happen. Almost everyone was betting on the fact that the Republicans would not just gain the House, maybe the Senate, but by a large margin, and that didn't happen. Normally in a mid-term election – you know this – the party out of the White House has substantial gains; sometimes 40 seats, sometimes 50, we don't even know what it will be. After California went [UNKNOWN]. But the bottom line is: normally, with the White House under Democratic control, high inflation, low Presidential ratings, COVID, people have to worry, normally there would be a real strong surge to the Republicans. They didn't get that. Now we can speculate; we were hoping the quality of our candidates would make the difference, in a close election, which does make the difference. So, I think that helped us a lot. Even though people are upset about inflation, I think that – and they were prone to protesting what's going on – I think they're worried about the lack of civility in our society. When we talk about Crime, they're also thinking about people storming the capitol. [UNKNOWN]. People were worried about violence, lack of civility. I think the attack on Paul Pelosi, the impact of people voting; it was a huge number of straight party voting for the Democrats. So, I think all that combined to give the Democrats some resilience in the election. That doesn't mean the House won't be above them; I sense that it will, but by a narrow margin.

But the Republicans are going to drive Kevin McCarthy crazy, they will, because he's got 60 people in the Freedom Caucus, and he's no Nancy Pelosi; he has not been able to keep that group together in a unanimous way to enact legislation. In the meantime, Joe Biden, he's got all these new laws that are passed – the bipartisan infrastructure plan, the Build Back Better, Inflation Reduction Act, the CHIPS Act – Joe Biden and this administration could spend the next ten years making all that work. They can turn a shovel and cut a ribbon all over the country for the next few years, and they'll probably invite the Republicans to come to the party. Every member of Congress loves to dedicate projects. So, he's got a lot to work with.

In the meantime, by the way, Michigan, where I was, we had a historic victory – not yet had, actually – in modern history. We swept everything there, and that was not expected. We thought she'd get re-elected, but she got re-elected by 11 points. The only person who got higher than that was me, but that was many years ago.

The final thing is this: Donald Trump is a big loser in this. In Florida, Ron DeSantis is a winner. They are going to be two scorpions in a box. We're going to watch that; that's going to be really interesting. And the next thing I should say to all you is, well, it really won't affect the relations with Canada. No matter which party's in power, people value, in Congress, the relationship with Canada. They do, despite some of the kookiness of the Trumpsters over time, the truth is, we did get the new, modified, improved NAFTA. That's one of the major achievements

of the Trump administration. It took longer, you know; it took a year longer than it should have. But the fact is that the relationship with Canada, regardless of all the politics down here, will be very good, and hopefully it improves some more. There are some areas where we need to improve, but I'm not going to get into that here. But thanks for listening.

Mr. PETRAS: Thank you. Before we go, remember: mark your calendars, April 20th and 21st in Cleveland, for the Canada-United States Annual Conference. So, meeting adjourned. Thank you.