

Center for Strategic and International Studies

TRANSCRIPT

Event

**“Seizing the Quantum Opportunity: Deputy Secretary
Don Graves: on Commerce's Quantum Initiatives”**

DATE

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FEATURING

Don Graves

U.S. Deputy Secretary of Commerce

CSIS EXPERTS

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Transcript By

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John J. Hamre: Could you turn the mic on? Hey, everybody out there, come on in. We're ready to go. (Pause.)

OK. Are we – we're streaming? Ready to go? OK. We've got people out there that would rather than have coffee than come in and listen, so we'll just let them do that.

But I want to say thanks to you all for coming today. This is a very important conversation that we're going to have. Secretary Deputy Secretary Graves: has been a friend and a frequent visitor here at CSIS. And I feel so very grateful that we've had his leadership. He's one of those really unusual guys that has enormous talent, and then a – and conviction, and a will to serve. And that's partly why you're at the very top, Don. And I want to say thank you for that. We need your kind of leadership now more than ever.

We're going to talk today about the Quantum Initiative and the – look, I don't understand quantum. I mean, it's all black magic to me. I can't figure out what it is or means, but I do know it's important. And I know the secretary has been a champion for it. And so we're going to explore this today. And it's going to be – Dr. Dr. Shivakumar: is going to lead a conversation with Secretary Graves. I wanted to be here just so I could apologize to Don for stealing his MVP. Navin Girishankar was the most valuable player in the Commerce team. And when we needed to create a new division for economic security and technology, Navin stood out. And so my apologies, Don. But I don't feel bad. (Laughter.) OK, so, Navin, why don't you come up here and introduce the secretary?

Navin Girishankar: Good morning. Thank you, Dr. Hamre. It's really, indeed, my pleasure to invite the deputy secretary – our 19th deputy secretary of commerce, Don Graves – who I had the opportunity to work with but also have known for 30 years, and just delighted that he's come back to CSIS. This time I get to be on the other side and welcome him on a really important topic. Every time I think the deputy secretary has come here he's educated us and educated the American public on the many things that the Commerce Department is doing. I think, under Deputy Secretary Graves and Secretary Raimondo, the Commerce Department has become the center of gravity on many things related to U.S. economic competitiveness, technology leadership, and their role in national security.

And we're going to hear a good deal about that today when it comes to quantum. I think that the expansive role of Commerce really mirrors what we've been aspiring to do in our newly formed Economic Security and Technology Department here at CSIS. And we view our mission – our singular mission is providing strategic insights and practical policy

solutions for the U.S. and its allies, to maintain, sustain economic and technology advantages that are going to be essential to our long-term prosperity, to our security as democracies, and to our resilience to global challenges like climate change and pandemics.

It's a broad menu of things that we're working on, but ultimately it's these kinds of interactions and opportunities with senior leaders across government and business that really allows us to shape the debate. And so, with that, I really want to welcome the deputy secretary here and my colleague, Dr. Shivakumar, who leads the Renewing American Innovation project. And they'll have a very interesting conversation.

So, brother, Deputy Secretary, thank you for coming. (Applause.)

Sujai
Shivakumar:

So, Secretary Graves, let me also extend my hand out in welcoming you to CSIS and for joining us for this fireside chat.

You know, as Dr. Hamre pointed out, quantum technologies is often something of a mystery. But from the policy perspective, you know, let's begin with the basic question. You know, why is quantum important? Perhaps exploring this from the perspective of research and growth, and perhaps also security.

Deputy
Secretary Don
Graves:

Well, Sujai, thank you for the question.

Let me just start by – I'd be remiss if I didn't thank John for – and CSIS for the fantastic leadership in this intersection. And I think Navin coming over – I will not forgive Navin for leaving, actually. We're dear friends. So – but this intersection of national security and economic security, I think, is perhaps the single most important area of study, analysis and policy development for our country's long-term success.

So I think it's also important for us, building off of your question, to take a step back to think about quantum. I know a lot of people, when they hear the word quantum, they're confused by what it means. Maybe they've heard about a James Bond movie that includes quantum, but that didn't make a lot of sense. Maybe they think, oh, it's measurement of something or other. But they know that it has to do with PhDs and scientists and things like that.

I think it's important to not talk about things like neutral atoms and qubits and cryptanalytically relevant quantum computers and quantum – things like that – and talk about what it actually means. It's an enabling technology. It really is – if you think about the course of technologies development, think about what the internet did for our ability to share information.

Quantum is basically an enabling technology that allows us to do much more than we had ever thought about doing. Imagine you or me or John in the Olympics, for instance, and what we could do in the Olympics. John, I'm sure you would do just fine. But quantum is basically like going from us in the Olympics to Simone Biles or Sha'carri Richardson. So it's enabling us to do a whole lot more than we had ever thought possible.

So that's why it's so important for us to imagine things that we had never been able to imagine, to do more than traditional computing, computer – traditional information science had ever allowed us to do.

Dr. Shivakumar: So there's a technological frontier that – and the possibilities that are pregnant, as you point out. But also we have – you know, we're in this intense geopolitical environment today.

Deputy
Secretary
Graves: Yes.

Dr. Shivakumar: So what are the stakes for the U.S. in terms of, you know, the leadership in this area?

Deputy
Secretary
Graves: Well, I'd take us back to where we were 40, 50 years ago when semiconductors were becoming big and the United States was the leader in the world in semiconductors. We developed and produced more chips than the rest of the world. And then we took our foot off the gas and we allowed the semiconductor companies to move to other parts of the world.

And now, you know, thanks to the president and vice president's leadership, we are trying to get back some of that leadership in partnership with our allies. But also we're investing in places like in areas like quantum to ensure that we don't lose that leadership. We are the world's leaders in quantum, but we can only maintain that leadership if we're able to continue to invest and continue to develop cutting-edge quantum technologies. And so that's why this invest in America agenda is so critically important because we have to maintain our edge over competitors and adversaries.

Dr. Shivakumar: So with that in mind, you know, let's sort of unpack what Commerce's role is in this. I think it has been suggested to me that, you know, the Department of Commerce, you really ought to be called the Department of Commerce and Innovation – (laughter) – because you have agencies as diverse as NIST, EDA, ITA, and BIS, and others in the mix. And you know, one of Commerce's most remarkable aspects is NIST, which is our

National Institute of Standards and Technology. It really plays a crucial role in measurement, and standards, and quantum. Can you tell me a little bit more about NIST's research programs on quantum and the other ways by which NIST is leading some of this effort?

Deputy
Secretary
Graves:

Well, you said it correctly, and a lot of people think of Commerce as the department of business or the department of CEOs. We are really the department – and yes, we work with CEOs, we work with business, of course, but we're also the department of data, science and technology. We're the department of people and communities. We have – depending on how you count them, 11 or 13 bureaus – from NOAA to NIST, Census, Economic Development, International Trade – we're all over the place.

But we've been involved in cutting edge technology since the Commerce Department was a department, and frankly, even before when some of our component parts were standalones. So NIST has actually been involved in quantum for nearly 100 years, since quantum was first being developed as a concept. If you think about the atomic clock, which is a critical component of a whole range of technologies – GPS, for instance, we wouldn't be able to do our work, we wouldn't be able to use the global positioning satellites as effectively if we didn't have quantum clocks – atomic clocks. And NIST really was at the cutting edge of that work.

So NIST has had a number of our laboratories really at the cutting edge for decades and decades. NIST – I mean, it's no surprise that NIST has four Nobel laureates because we're always pushing the boundaries.

In fact, I was just out in Colorado last week to launch our – and do the groundbreaking for our \$30 million investment in quantum, and had the opportunity to go from the groundbreaking to meet with one of our Nobel laureates, Eric Cornell, who is also – who is also at University of Colorado, So it's this connection between the labs, between the universities, and then of course the companies that are doing this, the application of this cutting-edge work.

Dr. Shivakumar: So as you aggregate the different parts of the scientific, the universities, the research, and as well as the commercial industries that are coming together, you know, we actually – the whole industry is actually what has been described as an inflection point between –

Deputy
Secretary
Graves:

Yes.

Dr. Shivakumar: – between being primarily a research and development activity to more

of an industrial capacity in the United States in industry. So some of the glue that has been coalescing around all these different elements has been the Tech Hub program to the Economic Development Administration. So tell us a little bit more about how EDA's role is forming up in this mix.

Deputy
Secretary
Graves:

It's a great question, and as I said, it's part of this Invest in America strategy. For years we've been involved in a lot of these cutting-edge technologies, but for too long we've allowed the research and development work to then be executed out around the world. And of course we want to work with our partners and allies, but we need to retain more of that leadership here in the U.S. and retain more of the manufacturing capacity.

And so, as part of those big four pieces of legislation that everyone knows about – the American Rescue Plan, Bipartisan Infrastructure Law, CHIPS and Science Act, and Inflation Reduction Act, we've been given new authorities and a significant amount of investment dollars to invest in critical and emerging technology nodes.

We know that we can't invest the way that some countries do, like the PRC, and just throw money willy-nilly into things. We have to be very strategic. We have to rely on our private sector to drive development, but we can make investments where the private sector – where there's market inefficiencies, where the private sector needs additional support. And so that's what we've done through the Tech Hubs program at the Economic Development Administration at Commerce. We're picking a handful of those technologies that we know we need to invest in, we know that we need to have and retain American leadership. And we're investing to sort of supercharge those ecosystems. It's about – and in this case, we picked the Elevate Quantum Tech Hub out in Colorado, where there is this center of gravity for quantum, not just from the United States but it's really a global leader.

So our investment is going to drive research and development. It's going to drive the development of a facility there in Arvada that will attract – it's already attracting dozens of companies, along with the universities – both the University of Colorado as well as the Colorado School of Mines. That will allow us to create workforce pathways, attract talent and keep talent, to bring in startup companies and more established companies all into one place. It's essentially doing what we did in Silicon Valley with some – a little bit of government support, to create a quantum ecosystem there.

Dr. Shivakumar: So the opportunity is there, or you're bringing all these actors together, but what are the challenges in actually getting them to work together?

When you visited Boulder, what –

Deputy
Secretary
Graves:

The great thing is, quantum is in its – I would say, despite it being around as a technology for 100 years, and really taking off in the '80s, it's still in its infancy. So a lot of these companies, like in Silicon Valley, they share resources because there's only so many resources to go around. The equipment costs a lot of money. So the companies work together closely with the universities. And so the companies are sharing employees, to some extent. There's this virtuous circle. In fact, one of the companies we visited was talking about how they talk with other companies to get ideas on how to solve many of the challenges they face. This is a place where the – in fact, all the boats can rise if one of the boats is rising.

Dr. Shivakumar:

Mmm hmm. Now, you mentioned resources. And then, of course, the other aspect of this is the supply chain to keep this industry – basically keep that tide rising. How firmly is that supply chain actually grounded in the United – in the United States, particularly with the various supplies of critical minerals and so forth that are needed for this?

Deputy
Secretary
Graves:

I'm glad you raised the supply chain, because unless we have a resilient – we've seen this. If we don't have a resilient supply chain, we're not going to have the leadership and technologies that we need going forward. What we saw during the pandemic, there were – we had limited access to critical components, like semiconductors. It meant that our car companies, our appliance companies, our medical device producers, couldn't produce their equipment. And that had downstream impacts. Certainly couldn't get access to the technologies we needed. But it also meant that that people weren't working, and it's had long-term implications for things like inflation.

What we're trying to do right now is make these investments, but to do it in a way that also understands the supply chain constraints. And so that's the great thing about the Commerce Department. We have the Supply Chain Center that the president called for, that we've established at Commerce. We just announced, not too – a few weeks ago our Scale Tool. It's the first of its kind tool that allows us to look at those vulnerabilities, those choke points in supply chains all across the spectrum to better understand where our challenges are. We can't be in a place where a country holds us hostage because we don't have access to critical input, critical components for our supply chain. So that's part of what we're trying to do, is make sure that as we invest in this technology hub, that we're also investing in a more resilient supply chain and ecosystem all across the country, and with our partners and allies around the globe.

Dr. Shivakumar: So, again, ITA is a key part of your portfolio and ITA is working with countries as diverse as Denmark, the United Kingdom, India, Singapore, et cetera.

Deputy
Secretary
Graves: Finland.

Dr. Shivakumar: Yes. To advance this – you know, the whole ecosystem globally on research, development, building supply chains.

So are they – what else – can you tell us a little bit more of what ITA's role and what they're doing and how this fits in with the broader Commerce portfolio of supporting this new industry?

Deputy
Secretary
Graves: Well, the – what I said – what I'm saying about Commerce is that we are, perhaps, the most diverse agency in the federal government because we do data and science, we do technology development and research, because we are focused on international trade and economic development.

ITA is one component of this that's absolutely vital because they have the ability to analyze our industry and analysis group at ITA. Looks at the entirety of ecosystems across the globe. It has databases, the data sets, that really no other place in the world are all – is all of that information brought together.

And so they're able to work with partners like the ones you listed to better understand where there's opportunities, where – frankly, where our competitors or our adversaries have more control of these industries than we'd like.

And so for us it's getting that analysis done, having a better understanding, and then acting. So ITA works closely with the Bureau of Industry and Security on export controls to ensure that we're protecting our technology. They work closely with the Patent and Trademark Office.

As I've said on this stage before, you know, there's a handful – and I keep this – John, I keep bringing this card back up but I have this card that I keep with me that identifies what makes a profitable – a prosperous and equitable world economic order and it's – and why the United States stands above much of the rest of the world, and it's this connection to our private sector.

It's shared democratic values. It's our adherence to the rule of law. It's

the protection of worker rights and protection of intellectual property, creative capital markets, its transparency, clarity and predictability.

All of those things come together at the Commerce Department because we protect, we analyze, we provide guidance, we invest where we need to, and provide that predictability. Frankly, that's the way that we're going to win in quantum and a range of critical and emerging technologies is if we continue to adhere to those guides and make sure that we're bringing our partners and allies across the world along with us at the same time.

Dr. Shivakumar: Mmm hmm. You mentioned the Bureau of Industry and Security – BIS. Tell me a little bit more about quantum export controls that the department recently announced. How are they going to be affecting – you know, what's the impact on China and what's the impact on our allies as well on some of these initiatives?

Deputy Secretary Graves: Well, the great thing about the Bureau of Industry and Security is that they over the course of the last few years, no thanks to the illegal, unwarranted, unjust invasion – continued invasion of Ukraine by Russia we've learned a lot about how effective the export control tools can be at preventing adversaries from getting access to our most important technologies.

So between the analysis at ITA and the export control work that BIS is doing we understand where we have the ability to use choke points to prevent our adversaries from getting access to the most critical technologies, using that effectively, and protecting our vital technologies like quantum.

It's allowing us to say, well, right now we're ahead. The United States is, perhaps, five or 10 years ahead of our closest competitors in quantum and, certainly, to the PRC. We have to do both an offense and a defensive strategy and so that's what BIS is doing.

We don't want to stop the world from being able to advance and develop technologies in total. We can't do that. But we can pick and choose those nodes, those technologies where we can have the most impact, and protect ours and our partners' and allies' leadership. But we can't do it alone. And that's why BIS works very, very closely with partners and allies. You've seen with the Russian invasion we put together a coalition of 37-38 partners around the world to use those export controls very effectively.

Dr. Shivakumar: So, you know, also, in terms of the restrictions, you know, one of the challenges with any sort of export controls is that often there's

collateral impacts on us and our allies. How does one balance that equation in terms of, you know, basically limiting the Chinese ability in some areas, but not harming ourselves in the process as well?

Deputy
Secretary
Graves:

This is why we have ongoing conversations with the business community. In fact, it's – before we implement our export controls, we have to engage with the community to better understand potential impacts. We speak at length with our partners and allies. We want to get that balance just right. We won't compromise on national security, full stop. That's something that is absolutely essential to us. But we have to recognize that economic security is also national security. So getting that balance right is important to us. And I suspect that as we move forward with the rules around quantum – and you all, if you haven't already done so, there's open comment period right now through November 5th. We are looking for your engagement, because we are taking that in as we create these rules of the road.

It's important, though, that we stand by the rule of law and the rules of the road so that we can, again, provide that predictability, that clarity, that transparency. What that, in turn, will do is allow us and our partners and allies to be more effective at creating the types of jobs that are going to come from quantum. It's not just about the Ph.D.s or the engineers. What I saw in Colorado is indicative of what you're seeing around the world in quantum. Eighty percent of the jobs that are being created in the mountain west, in that that cluster in and around Colorado, New Mexico, et cetera, don't require a high school degree – I mean, anything beyond a high school degree.

That is, frankly, something that we should be touting around the country. We're creating high quality, family sustaining, good paying jobs that that will sustain us going forward, and where the type of skills that you're building are easily transferable to other industries. So you can take a job in quantum and go and work in semiconductors, for instance, or a whole range of other fields. So it's important for us to invest, to protect, and it leads to really great outcomes for ourselves and for our partners and allies.

Dr. Shivakumar: I mean, the point that you make is, I think, a very strong one, which is, again, if you're thinking about our economic security, how do you connect our population into our innovation economy? And I think the investments in the skilled technical workforce, getting them involved and getting them to be stakeholders in some of these advanced technologies that, you know, are in some ways very esoteric, is really a critical part of your mission.

You know, as you look at – sort of, we've been talking about various

tools and agencies that are sort of working as a team, in a sense, towards building the ecosystem within the United States, reaching out internationally, making sure that the technology and the ecosystem, to some extent, is protected, what more can we do? And what are the resources that you need to do that?

Deputy
Secretary
Graves:

Well, we – there's discussion of a second CHIPS Act. Certainly, more resources are useful. We hope that Congress reauthorizes many of the programs that support quantum.

I think it's going to take continued focus on these areas of critical and emerging technologies – so quantum, AI, semiconductors, directed energy, photonics, which is part – tied to quantum. A whole – there's a cadre of these that OSTP, for instance, the Office of Science and Technology Policy at the White House, has identified. We should be looking to invest more effectively in those areas. We're not the PRC. We're not going to be able to just throw money to try and fix an issue.

So we have to be very – we have to be very careful about which we pick and choose, which areas of technology we pick and choose, and then recognize that if we do it correctly, if we do it in direct conversation with the business community, if we're talking with labor unions, if we're talking with workforce partners, universities, community colleges, high schools and the like, we can actually build the type of ecosystem that we need.

But I – again, I want to reiterate that we have to do it in partnership with our friends and allies across the globe. This is – we're not going to be able to do it all here. But that's fine, because we can – again, we can pick those areas that we see as providing value-add, that allow us to drive leadership in those technologies, work with our partners and allies so they're making investments that are complementary.

And I think that you will find that this new economic order that we're building is one where we can be very successful. As the vice president says, we're creating that opportunity economy that will work for everyone from a Ph.D. to a CEO of a company to a worker who is coming out of high school and trying to figure out what they want to do with their lives. These jobs are coming. These career opportunities are there. And companies are going to be able to build with that right type of investment.

Dr. Shivakumar: In a sense, what you've been describing is, you know, the playbook for how do we do innovation policy, which is, I think, a more robust term than industrial policy, which has a specific meaning and also some luggage that goes along with that term. So this is actually, in a way – you

know, you're talking about the challenge of bringing a very new technology, bringing its applications, bringing all the different parts.

But what you're engaged in is an equally or sufficiently complex issue of how do you actually put this playbook together to bring in the various parts of the government to provide a supporting role. Well, let me – I ask you to explain it to me.

Deputy
Secretary
Graves:

Yeah. No, you are exactly correct. This has to be a whole-of-government approach. It's what the president and the vice president have tasked us with doing. We certainly are using every resource at Commerce, so it's a whole-of-Commerce approach, from our National Institutes of Standards and Technology and our Economic Development Administration to BIS and our International Trade Administration.

But it also requires our partnership with my friend Panch and the National Science Foundation and the collaboration that we have there. It requires the work that we do with the Department of Energy; of course, our friends throughout other agencies, like Treasury for investments to HUD and Transportation, because you have to build the logistical hubs and systems that will work to allow our companies to build in those communities.

So it will require this whole-of-government – it is requiring this whole-of-government approach, working with the private sector. These have to be done hand in hand. You can't have one and expect the other to be able to do its work. So that's why I like your thought of innovation policy as the focus, that economic policy and innovation policy go hand in hand. And when we make the right types of investments, like in quantum, we'll be able to see downstream impacts that are about us leading the world in these industries.

Dr. Shivakumar: Also, you know, you just got back from Colorado. What's the role of the states and localities in the situation as well? Because, you know, we are a federal system. A lot of the issues relating to worker training and so forth are local issues in many respects.

Deputy
Secretary
Graves:

It's why we've been so focused on place as the center of our industrial policy or innovation policy. When we invest, we should be looking – and frankly, that's what was driving our Tech Hubs policy, our Build Back Better regional challenges, our Good Jobs program, and to some extent our chips program. We're looking at those nodes across the country, those hubs of activity where we can invest with the – with some reassurance that we're investing to protect the American taxpayer. We can't just throw money out willy-nilly, as I've said. We have to make sure that when we invest, we're building an ecosystem that creates those

good jobs, that builds off of local and regional excellence, where we're getting states and localities, to your point, involved in the investment, involved in building that and supporting that ecosystem, where we know we're going to have the workforce that we need.

I mean, frankly, the millions of jobs that are being created through investment in these technologies, whether it's polymers or quantum, these, again, are transferable. But we have to make sure that we've created those workforce pathways. We have to have, again, the universities, the community colleges, the workforce development systems in place. And so that's where the states are absolutely vital for us to be able to be successful at it.

Dr. Shivakumar: So maybe a final question, in terms of continuity. You know, very often you hear the idea that, OK, we passed CHIPS and Science. We maybe are close to reauthorizing the NQIA, et cetera. How important is long term – is commitment to building this ecosystem?

Deputy Secretary Graves: I think the country as a whole finally is recognizing that we can't do what we have done in decades past, and, you know, develop some cutting edge technology and then expect that it's just going to happen without renewed commitment and investment in those industries. So I think that we're in a place where these investments will continue. Obviously, we're in, as they say, the silly season, where, you know, things are happening in a month and a half. And we'll see what the next administration does in terms of where they want to place their emphasis.

But again, that's why we have partners like CSIS. It's why we have partners in the business community. It's why we have placed these bets, these investments, all around the country. We're building what I think are the types of technology nodes where people will see results. And where good – again, good jobs are being created, where people are going to make a lot of money. Which is – which is good. We just have to keep that – keep that going for the foreseeable future.

Dr. Shivakumar: Well, this is something that is important for all of us, and for the country's national security as well as economic security. So it's really important that we get this right. And so happy that you are, you know, taking such an important leadership role in making sure that this playbook gets written, and implemented as well. So thank you so much for your time and your wisdom, and for coming to CSIS, and to – meeting with us here today. Thank you so much.

Deputy Secretary: Well, thank you very much. And does anyone know why you should never trust an atom? Because they make up everything. (Laughter,

Graves: applause.) Thank you.

Dr. Shivakumar: Thank you.

(END.)