



**Compete.**

Council on  
Competitiveness

# Technology Leadership and Strategy Initiative

Spring Dialogue 2022

This publication may not be reproduced, in whole or in part, in any form beyond copying permitted by sections 107 and 108 of the U.S. copyright law and excerpts by reviewers for the public press, without written consent from the publishers.

**THE COUNCIL ON COMPETITIVENESS** is a nonprofit, 501(c) (3) organization as recognized by the U.S. Internal Revenue Service. The Council's activities are funded by contributions from its members, foundations, and project contributions. To learn more about the Council on Competitiveness, visit our home page at [Compete.org](https://www.compete.org).

# Table of Contents

Introduction	2
Opening Remarks by the TLSI Co-Chairs	6
Brainstorming Session: A New Strategic Direction for the TLSI Community	7
Radical Changewaves and the Need to Rethink and Scale Innovation Ecosystems Mr. Toby Redshaw	7
Alliance Building & the Future of Critical Research Collaborations Dr. John Smee	12
Leveraging the Council Community and Content for Greater Impact Mr. Steve Jost	17
Technology Transformation in Defense Technology Dr. Phil Root	18
Recruiting the Best and Brightest to Retain Talent in the United States Ms. Amy Nice	19
Balancing Talent Attraction and Retention with Research Security Dr. Rebecca Lynn Keiser	22
Streamlining a Bureaucracy for Success—the Brazilian Patent and Trademark Agency INPI Dr. Claudio Vilar Furtado	23
Co-chairs Closing Remarks and Conclusion	25
Participants	26
Speaker Bios	27
Council on Competitiveness Members, Fellows and Staff	30

# Introduction

Mr. Chad Evans, Executive Vice President, Council on Competitiveness (Council) opened the meeting and welcomed participants to the first in-person meeting of the Technology Leadership & Strategy Initiative (TLSI) since the beginning of the pandemic, Spring Dialogue 2022.

He reflected upon the history of the TLSI, now in its 13th year, and thanked co-chairs Dr. Jahmy Hindman, CTO, Deere & Co.; and Dr. Steve Walker, Vice President and CTO, Lockheed Martin, for their continued support and leadership. He noted that this meeting was the first dialogue for Dr. Walker in his new role as co-chair and thanked him for his leadership in many Council partnerships with Lockheed Martin, including a webinar series in 2021 under the auspices of the National Commission on Innovation & Competitiveness Frontiers and the TLSI.



**Top:** Dr. Jahmy Hindman, CTO, Deere & Co.; and Dr. Sally Morton, Executive Vice President, ASU Knowledge Enterprise, Arizona State University.

**Bottom:** Dr. Steve Walker, Vice President and CTO, Lockheed Martin

## Context for the Meeting

Looking toward the session and the discussions for the day ahead, Mr. Evans explained that the meeting is happening in an interesting policy context: After several weeks and numerous legislative actions, the United States is beginning to see a reconciliation of the differences between the Senate's United States Innovation and Competitiveness Act (USICA) and the House's America Creating Opportunities for Manufacturing, Pre-Eminence in Technology and Economic Strength (COMPETES) Act. While some important differences exist, both proposed bills address similar issues including, [foreign policy](#), [semiconductor manufacturing support](#), funding allocations for [scientific research and development and workforce development](#), and [trade policy](#).

The conference committee working to sort out the differences between the two bills, now being referred to as the Bipartisan Innovation and Competition Legislation, [convened for the first time on May 12, 2022](#), and is comprised of 107 members.

(NOTE: The final bill was passed on July 28 and included the authorization for a new Technology Directorate at the National Science Foundation.)

The [Technology Innovation and Partnerships \(TIP\)](#) directorate was developed to speed the development and deployment of the next generation of technological innovation, and meet societal and economic needs, including high-wage jobs and broader participation of Americans in the U.S. research and innovation enterprise (see Box 1).

### BOX 1

#### Technology Innovation Partnership Directorate (TIP)

The TIP directorate's strong focus on solving societal challenges and increasing the participation in America's innovation and research enterprise is strongly aligned with the National Commission's recommendations from its 2020 report *Competing in the Next Economy*.

As part of the Council's 10x strategy, the report recommends to "Ensure all federal, state and local programs and investments in innovation capacity and education address the access, diversity and inclusion of minorities and women—with a goal to increasing their participation tenfold" (p. 5) and proposes several measures, including partnerships for innovation and increase education efforts to create a strong U.S. talent pool.





*Technology Leadership & Strategy Initiative Spring Dialogue 2022 Participants.*

The TIP directorate will incorporate other NSF initiatives, such as:

- The [Innovation Core](#), a program that uses experiential education to help researchers gain valuable insight into entrepreneurship, and business and industry requirements and challenges;
- The [Partnerships for Innovation Program](#), which offers researchers from all disciplines of science and engineering funded by the NSF the opportunity to perform translational research and technology development, develop partnerships and accelerate lab to market transitions;
- The [Seed Fund](#), which offers up to U.S. \$2 million in capital for early-stage product development without equity or IP constraints; and
- The [Convergence Accelerator](#), which funds inter- and transdisciplinary teams to solve societal challenges through convergence in research and innovation.

Mr. Evans announced that Dr. Erwin Gianchandani, Assistant Director, NSF, who will spearhead the TIP directorate, will be joining the [Mountain West Innovation Summit](#), for which the Council partnered with three National Commissioners: Dr. Ed Seidel, President, University of Wyoming, and co-host of the event; Dr. John Wagner, Director, Idaho National Laboratory; and Mr. Greg Hill, President and Chief Operating Officer, Hess Corporation.

Mr. Evans invited meeting participants to join him and Council President & CEO, the Hon. Deborah L. Wince-Smith, in Laramie, WY, on Jun 21-22, 2022, for this event, as many of the conversations will serve as a kick-off point for the next National Commission phase of the work.

Expanding on the policy context of the TLSI meeting, Mr. Evans explained that while FY2022 appropriations have been resolved, FY2023 appropriations have only just started, and majorities in the next years remain unclear. With the Senate and the





*Dr. John Smee, Vice President for Engineering, Qualcomm.*



*Mr. Chad Evans, Executive Vice President, Council on Competitiveness.*

House possibly shifting towards a republican majority, democrats are expected to push for funding levels on issues they are most concerned about.

Mr. Evans emphasized that this is why, with the Council's reach, the TLSI can play a particularly important role in articulating a vision for why investments in the nation's innovation future matter. The first half of the meeting therefore serves as a brainstorming session to discuss what this group could do during the next 12 to 18 months to advance its agenda. He encouraged participants to also think about what a possible work product of this several months-long phase could be—a research paper? A policy statement?

## Framing the Session

To prepare for the brainstorming session, Mr. Evans announced that Mr. Toby Redshaw, CEO, Verus Advisory, and Council Senior Fellow, will expand upon his presentation from last month's *Competitiveness Watch* webinar, during which he discussed the drastic technology changewaves that the United States is facing, and how connectivity and innovations in computing have the potential to turbocharge innovation. Mr. Redshaw's presentation will be enhanced with a presentation from Dr. John Smee, Senior Vice President for Engineering, Qualcomm, who will discuss how the United States compares to other countries around the globe, and what the nation can learn from transatlantic exchange and collaboration to rethink and adjust the innovation ecosystem.

## Opening Remarks by the TLSI Co-Chairs

Dr. Hindman congratulated the Council and the TLSI community for the success of the past two years and for increasing the amount of work and output that has been produced and made possible through the monthly *Competitiveness Watch* webinars.

He stated that this meeting was a milestone for the TLSI community and will chart the path for the group leading up to the midterm elections and for the next two years. Part of this new path will be a research agenda for the TLSI exploring new partnerships. Dr. Hindman encouraged TLSI members to discuss what this new research agenda and engagements might look like.

Dr. Walker concurred with Dr. Hindman and added that this meeting should be seen as an opportunity to re-imagine the national innovation system. He discussed that the “how” is always the hard part, especially for large companies, but that the question of how the nation can be more competitive is crucial.

Dr. Walker also referenced that the current geopolitical situation with the Russian war in Ukraine have made it clear that the United States must also think about how it can make its partners and allies more competitive and resilient.

Looking towards the upcoming discussion, he mentioned two core questions that are relevant to the defense industry:

1. How can the defense sector work better with the commercial world to bring cutting edge innovations to the market?
2. How does the Council and the TLSI envision a new defense industrial base that benefits from the commercial world and the strong university system in the United States?

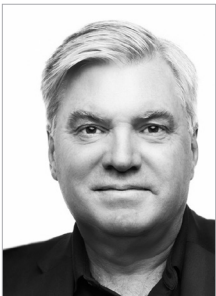
Mr. Evans thanked the co-chairs and introduced the first speaker for the day, Mr. Redshaw. Mr. Redshaw was previously the CTO for 5G technology at Verizon, and has helped companies such as FedEx, American Express and Motorola evaluate IT transformations to their industry.



# Brainstorming Session

## A New Strategic Direction for the TLSI Community

### Radical Changewaves and the Need to Rethink and Scale Innovation Ecosystems



**Mr. Toby Redshaw**

CEO, Verus Advisory  
Senior Fellow, Council on  
Competitiveness

Mr. Redshaw started his presentation with a quote from Charles Dickens:

“It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of light, it was the season of darkness, it was the spring of hope, it was the winter of despair.”

Charles Dickens, *A Tale of Two Cities*

In the same spirit of this quote, Mr. Redshaw explained that the world is approaching a similar dichotomy and polarizing moment in the history of innovation and technological advancement.

He noted that in 2009, he was invited to join the U.S. Special Operations Command (SOCOM) by [Admiral William H. McRaven](#), who explained that while the

United States continues to have the most innovative special forces on the globe, the level of innovation and competition employed by the enemy is accelerating. This need for innovation and accelerated new advancements is vital to maintain the U.S. global military leadership position, and strong defenses and national security.

Mr. Redshaw explained that creating a culture of innovation across the different branches of the armed forces is essential, but that change management is the first step to developing this culture. While people often spend a lot of time discussing how to ferment innovation, explained Mr. Redshaw, the focus should be on change management, which he described as an essential aspect of the 4th Industrial Revolution.

### Radical Changewaves Make the 4th Industrial Revolution Drastically Different

The rate of innovation is exponentially accelerating—which makes the level of technology advancements comparable in transformation to previous industrial revolutions. But with innovation comes creative destruction—previous revolutions have created sectors that “won” and experienced large employment and productivity growth, as well as sectors that “lost,” those that eventually became obsolete.

Unlike other revolutions, Mr. Redshaw explained that this one is happening faster during a time frame of about eight years and is layered with several radical changewaves that are unprecedented (see Box 2).

**BOX 2****Radical Changewaves that make the 4th Industrial Revolution Unique**

- Much of **Business to Business (B2B) is turning into Business to Business to Consumer (B2B2C)**. This change has tremendous effects on the supply chain—the resiliency of the supply chain is becoming increasingly important and data usage throughout the supply chain has intensified.
- The value derived from big “stuff,” such as locomotives, jet engines, combine harvesters, will increasingly come from the **services and experiences related to those things**, supported by advanced technology.
- Extended Reality (XR) will find more use in sales and end products, either in training on the product use or as part of the functionality of the new technology itself. Both the hardware and software—and the experiences derived from their integration—will play an important role.
- For many years, the mantra was: small and agile companies win the innovation game. Today, technology creates a different playing field, enabling an unprecedented **combination of scale and agility**.
- Technologies are increasingly interconnected and allow for **“Tech Legoization,”** in which the threshold for building innovative new technology software systems drops precipitously, powered by the decreasing need for specialized coding, etc.
- Many 2D environments will **transition to 3D**. Some of the applications include education, such as through immersive participative environments supported by technology.
- **Scaling an idea is becoming easier**, because the difficult physical aspects of developing an idea into action (such as talent, labor, distribution, and logistics) can now be rented just easily as a web application can be deployed.
- On the flipside, these technological advances also allow for **more activity on the Dark Web** and many of these technologies and combinations thereof (such as Tech Legoization, no-code/low-code adoption, etc.) are adopted on the Dark Web faster than anywhere else.

Because of the speed of innovation and transformation, it creates a need to drastically rethink the way people are trained and educated. Mr. Redshaw explained that some universities are already addressing this challenge, such as by moving from 2D education to immersive education and training in 3D.

**How Technology Is Creating New Opportunities**

New technologies are enabling businesses to grow and advance. Mr. Redshaw stated that today is the easiest moment in history to move from “PowerPoint to scale.” Scaling used to be a significant issue, because eventually a new business would run into

supply chain issues. Today, technology has made this step a lot easier, such as via Amazon Web Services and Alibaba.

The combination of advancements in the Internet of Things (IoT); Augmented and Virtual Reality; Next Generation Cloud; and AI and Big Data will reach further amplification through the 5G and beyond platform.

He explained that the United States has the potential to continue asserting global innovation leadership—possessing several distinctive innovation and research infrastructure assets: U.S. universities,

national laboratories in the Departments of Energy and Defense, etc. These assets, coupled with those of the private sector, need to be optimized for this new form of global competition in which rapid transformation is the norm.

## China Is Catching Up

Mr. Redshaw explained that the best enterprises on earth to absorb and scale start-ups are in China. China is investing tremendously in quantum computing, which not only creates a race in competition between China and the rest of the world, but also significant data security concerns. While encrypted data so far remains safe, quantum computing in the future may very well be able to decrypt data. China is purchasing large amounts of encrypted data for this reason, betting that decrypting these data stores will be possible in the future.

## The Importance of Innovation Ecosystems and Scaling

Historically, Mr. Redshaw explained, some of the biggest winners in leveraging emerging technology have been countries that have made great strides in developing and supporting a vibrant innovation ecosystem.

Mr. Redshaw mentioned how the United States has had tremendous success during the past half century in leveraging a few highly innovative ecosystems for national success. However, his provocation is that today, others have adopted and adapted the U.S. model, and are emerging as powerful innovation engines with the potential to rival U.S. dominance—namely, China, France, and the UK. As an aside, Mr. Redshaw noted a start-up founder from France 20 years ago would have immediately moved to the United States. Today, he contends, France is one of the most innovative places in the world, with innovation ecosystem growth driven by new, successful, and impactful public-private partnerships.

Mr. Redshaw explained one of the biggest threats to future U.S. innovation-based competitive leadership is China's ability to ferment innovation and change, as well as to scale these innovations and build them into

effective national and international competitors. Mr. Redshaw's contention is that, today, most U.S.-based companies would garner anywhere from a B- to a D- in their capabilities to scale innovations.

## How 5G Will Accelerate Tech-Based Innovation

Mr. Redshaw contended that if the four technologies featured in Figure 1 combine with super-fast, high-bandwidth, low-latency and highly-secure 5G networks/edge computing, this phenomenon would create a flywheel effect and a much steeper hockey stick curve—a kind of virtuous cycle. This 5G network and the possibility of jump starting the already rapidly transpiring changes underway in multiple tech realms is, he argues, the true engine of the 4th Industrial Revolution.

The speed of 5G allows for computing and AI in real time, which opens up opportunities for real-time problem solving—such as for applications for accident resolution, war, real-time intelligence, etc.

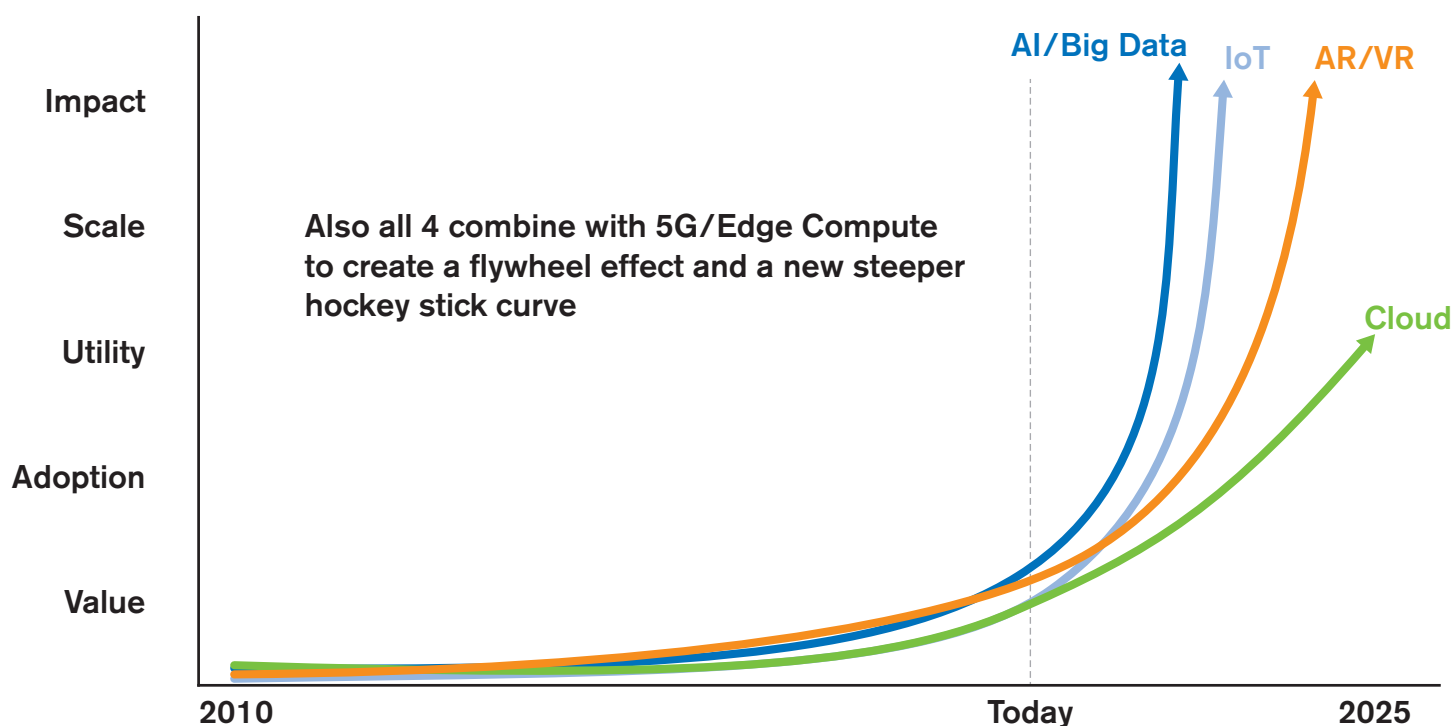
## Brainstorming with the TLSI Community

### Learning from Other Successful Innovation Nations and International Partnerships

As Mr. Redshaw referenced other nations, such as France, and how they have managed to catch up to the historically outstanding position of the United States as an ecosystem for innovation and business development, Dr. Sally Morton, Executive Vice President, ASU Knowledge Enterprise, Arizona State University, inquired about specific examples of how France has created their innovation ecosystem.

Mr. Redshaw explained that the French government has been leveraging key national innovation assets, especially in education. The transition from university research to running a company is facilitated and financially incentivized. He also pointed out that France has designated a high-ranking government official to figure out how the innovation ecosystem can be improved. He noted that by comparison, the United States has issues with leveraging its national assets.

**Figure 1: Hockey Stick Curve for Cutting-Edge Innovative Technologies and Their Impact Over Time**



Mr. Redshaw suggested that it would be worth exploring how the Council, and in particular the TLSI, can develop a bilateral relationship with key French innovation agencies and other entities.

Mr. Evans said that the Council already has several successful partnerships, such as with Brazil and Australia, and agreed that partnerships with allies in Europe would be a good path ahead for the Council.

Mr. Redshaw added that exploring innovation beyond U.S. and European borders may lead to some interesting results and gave the example of how infrastructure constraints in Africa caused some great innovations—the first mobile banking efforts came from Africa.

### **5G, 6G and the Digital/Urban-Rural Divide**

Dr. Tommy Gardner, CTO, HP Federal, mentioned that standards for 5G are already in place, and that perhaps it should be concerning that the United States is not focusing enough on 6G and possibly lagging behind on this issue.

Dr. Smee contended that research for 6G is already starting—and that the United States needs to first reach scale and see how the nation compares to its competitors. He also suggested a longer discussion on how innovation barriers in the United States can be removed.

Dr. Morton agreed with Dr. Smee and stated that the increasing digital divide, which has become particularly obvious during the pandemic when telework was crucial, is one of these barriers. Dr. Smee added





that it is necessary to leverage the investments that are already happening, such as 5G networks that are already being built. He noted that there are still schools that do not have access to the internet, and that education barriers are increasingly technology and connectivity barriers.

Dr. Hindman added that while the digital divide is real, the geographical divide between urban and rural areas is also a growing concern (and perhaps more so than the demographic divide). He asked if this really is a question of 5G or 6G, or perhaps a larger connectivity issue and encouraged the group to develop ideas around how connectivity could provide improvements to society.



Dr. Gardner offered that connectivity is not a technology issue, it is an economic issue. Broadband exists, but it is a matter of cost: Does the United States want to pay for this connectivity, or would it rather spend the money on other issues? He noted that in his hometown in Tennessee, the utility company runs the internet and provides 1GB of internet to everyone because it is considered a public good. The charges are anywhere from U.S. \$10–\$40/month.



Mr. Dan Scott, Senior Vice President of Technology, Engineering, & Manufacturing, Northrup Grumman, pointed out that no one has mentioned the importance of differing world cultures yet. While many of these issues are about technology and policy, it is also about culture—and that determines how different advancements are received in society. Rural electrification was never a question. The development of the interstate highway system was controversial, but has proven to be an extremely successful endeavor. In response to Dr. Gardner's anecdote about the utility company-run internet, Mr. Scott noted that providing a necessity is not socialism; it is infrastructure because connectivity creates a betterment for everyone. This simple distinction is viewed differently in different cultures, though.

**Top:** Dr. Sally Morton, Executive Vice President, ASU Knowledge Enterprise, Arizona State University.

**Center:** Mr. Dan Scott, Senior Vice President of Technology, Engineering, & Manufacturing, Northrup Grumman.

**Bottom:** Dr. Tommy Gardner, CTO, HP Federal.



## Alliance Building & the Future of Critical Research Collaborations



**Dr. John Smee**

Senior Vice President,  
Engineering  
Qualcomm Technologies Inc.

### Leveraging International Partnerships

Dr. Smee opened his presentation by reflecting upon how he started a team within Qualcomm France, and how the French government was quick to not only help with funding, but also with connections to French universities and top academic minds, companies and startups, and advanced manufacturing and AI experts to help reach scale.

He referenced the [U.S.-EU Trade and Technology Council \(TTC\)](#), which was established in September 2021 under the auspices of the U.S. Department of State, and met for a second time on May 15-16, 2022 (see Box 3). He noted that not every problem has to be solved *by* the United States and *in* the United States. Instead, he suggested the question is how and where can the nation can build partnerships, leverage transatlantic cooperation, and help reach scale across many different enablements and innovation ecosystems. He said that partnerships can help to drive individual countries' ecosystems and make them stronger through collaboration.

Dr. Smee contended that looking at the White House list of emerging and critical technologies, the United States possesses a strong mixture of skills, and that U.S. models are evolving and becoming more European. He noted that while this is a good direction, the U.S. model should obviously not be 100 percent identical to any European model, since there are pros and cons to each model.

### BOX 3

#### U.S.-EU Trade and Technology Council (TTC) Holds Second Meeting in France

U.S. Co-Chairs Secretary of State Antony Blinken, Secretary of Commerce Gina Raimondo, and U.S. Trade Representative Katherine Tai were joined by EU Co-Chairs and European Commission Executive Vice Presidents Margrethe Vestager and Valdis Dombrovskis on May 15 and 16, 2022, in Paris for the second meeting of the TTC.

The meeting helped to resolve long-standing bilateral issues, including disagreements on tariffs. Given the current geopolitical situation, the meeting addressed several trade-related issues related to sanctions and export control measures to respond to Putin's war on Ukraine, but it also focused on the continuous work of TTC working groups to deepen the cooperation between the United States and Europe by expanding access to digital tools for SMEs and securing critical supply chains, such as semiconductors, emerging technology standards, ICT security, etc.

Find out more [here](#).

### A Model for a Council Effort to Advance Alliance Building and the Future of Critical Research Collaboration

Dr. Smee presented a model for the Council to move forward and develop new ideas on how the TLSI can leverage its network of technology leaders and make a meaningful policy impact in Washington, D.C.

The proposed four-step plan (see Figure 2) could be used as a template for ideas during the brainstorming.

### 1. Identify Barriers

Identifying existing barriers to the innovation ecosystem in the United States and to expanding transatlantic R&D collaboration is a critical first step. Dr. Smee noted that there are barriers in the supply chain that many smaller companies can not overcome, while large companies have a certain level of resilience because of their size. Dr. Smee shared that many large corporations already have acquisition teams that are looking for complimentary, interesting startups. However, there are more things that can be done in the United States to grow a company from 10 to 100 to 1,000 people. So far, this is a significant challenge, because to survive as a company of 1,000 people for 10 years, the company has to be sustainably profitable (in terms of funding, revenue, employee retention, etc.). A company with 10,000 engineers is more sustainable as a business, because there is some predictability.

Reworking public-private partnerships to help bring scale to the smaller companies, and advancing transatlantic partnerships with key allies, could help eliminate some of this barrier.

### 2. Raise Awareness

Dr. Smee described how cancer wards had to be transformed into COVID wards during the pandemic. However, the regulatory environment for certifying equipment and providing tele-healthcare did not exist for these unprecedented circumstances.

Dr. Smee added that in a recent National Academy of Medicine committee meeting on emerging technologies, it was noted that bringing new technology into medicine is faced with barriers that are several decades old (such as those established by the American Medical Association, FDA, etc.). During the pandemic, the United States was confronted with the same challenges as many other countries across the globe. This opened up an opportunity for collaboration between the United States and its allies to address problem solving faster and in a way that makes sense for the future, while also understanding diverse ecosystem requirements.

**Figure 2: Proposed Council Effort to Advance Alliance Building and Critical Research Collaboration**



Dr. Smee's example of the acute need for changes in regulations during the pandemic shows how raised awareness can help break down some of the barriers to technology innovation.

### 3. Funding and Collaboration

Dr. Smee noted that 6G and semiconductors are good examples of technologies where the United States is actively looking at what is happening in other countries and what policy solutions are being developed. However, there are many other challenges where the United States could benefit from further international collaboration with its allies.

### 4. Public-Private Partnerships

Dr. Smee said that it should be expected to take government, academia and industry a while to get used to a new model. He suggested that public-private partnerships and transatlantic collaborations for the exchange of talent should be explored for successful research collaborations.

## Brainstorming with the TLSI Community

### Regulatory Constraints and "Monument" Constraints

Mr. Dan Newman, Senior Technical Fellow, VTOL Systems at Boeing, concurred that regulatory constraints made fast-paced changes more difficult, but noted that in the example of the medical field, it was also about "monuments." Monuments are fixed, stationary pieces of equipment. These monuments are a constraint not just in the medical field, but also in manufacturing—many companies want to get rid of the monuments that make redesigning the manufacturing floor for a new product or process more difficult.

Mr. Newman also noted that many of the hospitals that had monuments never expected to have to change quickly because the regulation would usually not allow for swift changes, which further illuminates the tremendous impact of having vs. not having the ability to quickly make regulatory adjustments.



*Mr. Dan Newman, Senior Technical Fellow, VTOL Systems at Boeing.*

But even when the regulation allows for agile and reactive movement, Mr. Newman noted, no one is able to capitalize on the lack of regulations because business models in the United States do not prioritize growth and adaptability. Instead, the focus is more on today and tomorrow, and less on continuing to be able to use a device for 20 years.

Dr. Smee concurred and added that having equipment that is agile is necessary, but that building resilience into this agility should be a crucial aspect of the discussion.

Dr. Hindman suggested that the group think about regulatory barriers that the nation faces as an impediment to fast innovation and highlighted that when in crisis, there is obviously a need and desire to change regulation to meet the requirements of the current situation. As an example, he noted the fast-paced regulatory changes that were made to accommodate pharmaceutical innovations such as mRNA-vaccines. But the question remains how this can be used and leveraged to move other innovations into adoption faster—in other words: What can be learned from the pandemic to reduce barriers to commercialization?





*Dr. Jay Walsh, Vice President of Economic Development and Innovation, University of Illinois System.*



*Dr. Jennifer Lodge, Vice President for Research and Innovation, Duke University; and Dr. Jeanne Hossenlopp, Vice President for Research and Innovation, Marquette University.*

## Talent Attraction and Retention

Dr. Smee emphasized that internal processes are important. During COVID, no one went on vacation, and a lot of companies actually accelerated their business processes, but now that adoption is high, they are noticing the lack of an educational ecosystem that supports the talent supply chain. He stressed that developing such an educational ecosystem would allow for greater international collaboration and partnerships with allies.

Dr. Smee highlighted the key issue of addressing what happens to students that want to stay in the United States after finishing advanced degrees. Talent immigration and retention should be a fundamental aspect of supplying the United States with people who can participate actively and contribute significantly to the nation's innovation outcomes.

He stressed that from his experience, many CEOs think that the H1B visa cap for specialty occupations is not favorable to attracting and retaining talent in the United States.

Dr. Morton agreed and added that talent retention is also an issue among faculty—foreign talent in the STEM subjects rarely join their institution's faculty. Instead, many universities lose this talent to Google

or other big tech companies. She stressed the need for arrangements that would allow talent to move back and forth between academia and industry.

Dr. Smee concurred and added that retaining talent within university faculties would also help to distribute talent across the United States.

Dr. Hindman agreed that the integration of academia and industry is crucial, including that Deere has visiting scholars because of long-term relationships between employees and universities. The question remains how such relationships can be made a possibility more broadly. He noted that in China and Europe, the barriers to making these relationships happen are much lower, and the TLSI could emphasize how the United States can learn from such examples.

Dr. Jay Walsh, Vice President of Economic Development and Innovation, University of Illinois System, noted that it should be a priority to not intensify societal divides that already exists across the United States (e.g. urban vs. rural) and recognize that the nation is already leaving incredible amounts of talent undeveloped. He added that while some of these issues are infrastructure-related, they also are related to incorrect assumptions that public and rural colleges have a lower impact on innovation, when they actually play a significant role in their communities and could be better leveraged.



*Dr. Anthony Peurrung, Deputy Director for Science and Technology, Pacific Northwest National Laboratory.*

### **Talent Retention and National and Research Security**

Mr. Scott commented that public-private partnerships and international collaboration are key, but that speaking from Northrup Grumman's perspective as a U.S. \$36 billion defense company where about 70 percent of processes are classified, partnerships for business applications for research present a significant challenge.

Dr. Smee suggested that the solution is to create an engineering talent pool to increase the supply of skilled engineers and technicians, recognizing how the United States can have more of a trade zone and making it a more friendly environment for top foreign talent, even before they join the more secretive zone of defense suppliers. Global competitors are catching up, and China is continuously graduating classes with a broad view on education and industry placement.

### **STEM Education vs. Basic Training and Education Across Communities**

Mr. Redshaw agreed that ensuring the education pipeline for engineers and technicians is important, but that this challenge does not compare in magnitude to the challenge of re-training and educating the general population. He asserted that if given a choice between: 1. A 20 percent higher match of

talent coming out of state schools vs. what the economy currently needs, and 2. More graduates from the Illinois Institute of Technology, he would choose No. 1. While both are very much needed, creating a higher match between training and education with what the economy needs is of the utmost importance.

Dr. Jeanne Hossenlopp, Vice President for Research and Innovation, Marquette University, concurred and noted that in her role sitting on the Board of the Milwaukee Academy of Sciences, a public charter school, she witnessed that nearly every student is economically disadvantaged. These students chose to come to a place with a STEM and medicine focus, but the barriers that the school sees every day preventing attendance are huge. Bringing in the surrounding communities to participate in innovation is therefore crucial.

Dr. Walsh agreed and described how a bottom-up approach is needed. Educators are the ones driving the process every day. Setting up incentives for them to move in a particular direction is important. He also noted that smaller universities have a tremendous impact, not only on their local communities, but also by producing a large percent of U.S. graduates.

### **What Is the Infrastructure of the 4th Industrial Revolution?**

Dr. Anthony Peurrung, Deputy Director for Science and Technology, Pacific Northwest National Laboratory, asked the group to think about what the infrastructure of the 4th Industrial Revolution could be. He noted that in the 1950s, it was the development of the interstate highway network. Maybe today it is exascale computers or brighter light sources. He noted laboratory systems are becoming more autonomous, and perhaps that is not something that small, medium or even large companies can adapt to quickly, but instead that is something that governments need to address and tackle.

Mr. Evans agreed with Dr. Peurrung and said that perhaps certain innovation infrastructures need to be addressed as global challenges that lie beyond the capabilities of the United States alone. He noted that



the Council's sister organization, the Global Federation of Competitiveness Councils (GFCC), published a report in 2018, *Leveraging Extreme Innovation* (see Box 4), which highlighted groundbreaking, innovative efforts to address global challenges through international collaboration.

### A Call to Action

Mr. Evans thanked Dr. Smee for his presentation, noting how the collaboration model (Figure 2) should serve as a template for the TLSI moving forward. He encouraged participants to be active and help the Council to craft a content and impact strategy for technology- and innovation-related issues that could be developed as a report, an event series, or another format, and asked TLSI members to think about priorities within their respective networks and bring these back to the group for the upcoming TLSI discussions.

### Leveraging the Council Community and Content for Greater Impact



**Mr. Steve Jost**

Senior Vice President  
Subject Matter

Subject Matter is a creative advocacy and strategic communications firm based in Washington, D.C., and has been a partner of the Council's since 2019. In 2020, the Council involved Subject Matter in several of its strategic communication efforts, including the work of the National Commission, the newsletter and to manage several of the online events during the pandemic.

Mr. Steve Jost, Senior Vice President, Subject Matter, summarized how the main objective of his and his team's work is to leverage the content and elevate it to a broader audience.

#### BOX 4

### Leveraging Extreme Innovation

Big, bold, transformational projects—across time, industries and nations—have a tremendous impact on the economy, new technologies and applications for innovative ideas. Universities play a significant role in providing the talent and infrastructure for these projects, and in developing partnerships to make such projects a reality. The Leveraging Extreme Innovation Task Force, launched in 2016 by the GFCC University and Research Leadership Forum in London, explored 17 multibillion dollar transformational projects across 60+ years in the *Leveraging Extreme Innovation* report.



He described the success that Subject Matter has had on behalf of the Council reaching appropriate Congressional staffers. Demographics played an important role in tailoring these efforts. The average age of Congressional staffers is between 29 and 31, and the positions they hold present an additional challenge because the turnover rate is 30 percent, making the development of longstanding relationships much harder.

So how can the appropriate audiences be reached? For a long time, radio (such as WTOP) used to be a good outlet because people were listening while commuting to work. But with the pandemic and the increase in telework, people are commuting and listening to radio outlets less. Today, the most successful route to reach staffers is via LinkedIn.

He noted that a key part of the new strategic direction of TLSI communications should be how the work of the TLSI can become more impactful, and encouraged the community to think about actionable products for the community—a slogan such as **“If we do not innovate, we do not compete,”** and a big picture, such as Dr. Walker’s question as to what the U.S. innovation system should look like (an actionable picture that the TLSI can paint).

He noted that storytelling is important to communicate this heavy content. Subject Matter can help bring a journalistic perspective to the policy ideas forward for greater impact. He also pointed out that the Council has a strong portfolio that differentiates it from other organizations in Washington, D.C.: it is unbiased, strongly focused on national interest, brings a non-partisan perspective forward, and communicates this content in an accessible way that is easy to understand and navigate.

## Technology Transformation in Defense Technology

### Dr. Phil Root

Director of the Strategic Technology Office  
DARPA

Dr. Phil Root, Director of the Strategic Technology Office, DARPA, discussed technology and innovation opportunities in an era of disruption. He noted that it appears as though DARPA goes into certain areas of research and development with incredible foresight. However, that is not necessarily always the case. In hindsight, these efforts may appear to be cohesive, but in real time, much of DARPA’s work is exploratory.

### Rethinking Warfare

Creating new paradigms of warfare and a new level of connectivity between air, land, marine and subterranean military applications is crucial for the next generation of tech applications in defense.



*Dr. Phil Root, Director of the Strategic Technology Office, DARPA.*

Dr. Root noted that the conflict in Ukraine has created a new language to use, and has unveiled that if nothing is done, and there is not forward movement on new, innovative approaches to defense, the problem will persist. However, trust in disruptive technology is an important aspect of this effort as well. National security leaders have to ask themselves what could have been done before February 24, 2022, when Russian troops invaded Ukraine, and DARPA can help in this conversation.

### DARPA—From Making Things to Improving Solutions Through Services

Dr. Root encouraged listeners to break with the idea that DARPA “makes things.” Very often, what DARPA makes is a very different conversation. The [Urban Reconnaissance Through Supervised Autonomy \(URSA\)](#) program has changed some of the discussion around the use of AI by rapidly identifying hostile intent and filtering out threats in complex urban environments. Programs like this that provide measurable impact to national security efforts are what is needed to change the conversation and policies.

Disruptive technology is natural to DARPA, but Dr. Root noted that disruptive does not necessarily mean innovative. Innovative means something new and useful in a non-linear trajectory. Disruptive can

also mean discontinuous; doing something much more quickly than originally foreseen—getting to a solution faster in a linear way, but at a very steep slope.

Dr. Root noted that this becomes a challenge for building trust; if the United States is disruptive and discontinuous, it is very difficult to build trust.

### **Growth Areas for DARPA**

Dr. Root explained that technology advancements have enabled significant new growth areas for DARPA. He added that the Ukraine crisis created a new opportunity to define how DARPA can help to create regional stability by working with partners and allies. He noted that the strategic strength of the United States also depends on its ability to reinforce the strategic force of its allies. De-escalation tools are thereby becoming increasingly important for DARPA.

### **Discussion with the TLSI Community**

Mr. Redshaw commented that from Dr. Root's presentation, he learned that much of DARPA's work is increasingly architectural—to build systems that support national security leaders—and less about manufacturing of physical products. Dr. Gardner agreed, and noted the impact and military and commercial value of quantum technology in this context, especially in encoding and decoding sensitive information. He observed that cyber security is necessary for military use, but is also critical for commercial use and mentioned the [Joint Cyber Defense Collaborative](#), which was established in 2021 to unify defensive actions and drive down risk in advance of cyber incidents.

Dr. Root contended that there is indeed a race to quantum information, but that different countries also address these issues differently. For example, in Europe, the majority of the population cares much more about data security.

Participants suggested a stronger integration of cyber security with engineering solutions, and noted that the question is what would make such integration go faster and be more internationally competitive. This is a policy and technology question.

Mr. Evans asked the group to think about ways in which the TLSI can help to elevate DARPA's mission. He shared that during the morning session, the group had an extensive conversation about strategic partnerships and collaboration, and that seemingly other nations are starting to adopt the DARPA model, such as the [Advanced Research and Invention Agency \(ARIA\)](#) in the UK.

## **Recruiting the Best and Brightest to Retain Talent in the United States**

### **Ms. Amy Nice**

Assistant Director for International Science and Technology Workforce  
White House Office of Science and Technology Policy

Ms. Amy Nice, Assistant Director for International Science and Technology Workforce, White House Office of Science and Technology Policy, summarized that she will be addressing the talent and funding aspect of recruiting, and that her NSF colleague Dr. Rebecca Lynn Keiser will later address some of the research security constraints.

### **The Biden-Harris Administration's Emphasis on STEM Talent**

Ms. Nice described her presentation as a perspective on the administration's effort to implement and develop agency efforts to attract international STEM talent. She noted that in March 2021, the Biden-Harris Administration announced the Interim National Security Strategic Guidance (see Box 5), which was centered around three main objectives:

1. Protecting the security of the American people;
2. Expanding economic prosperity and opportunity; and
3. Defending American values.

She noted that attracting and developing more STEM talent is vital to reaching these goals and added that this is one of the core pillars to achieve technology excellence and economic competitive-



*Ms. Amy Nice, Assistant Director for International Science and Technology Workforce, White House Office of Science and Technology Policy.*

ness for working people across the country. She stressed the administration's emphasis on this issue by adding that, among other reasons, this is why the administration created a full-time STEM immigration policy position within the White House Office of Science and Technology Policy, which is focused on policies that can attract talent.

### Cross-agency Collaborative Efforts

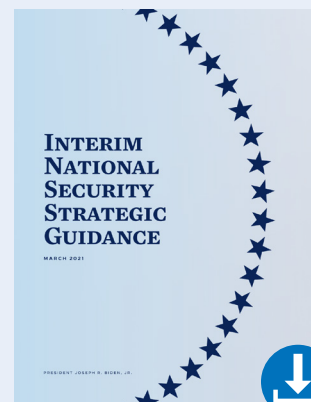
She noted that in her role, she is working with colleagues across the Executive Office of the President—especially the National Security Council and the Domestic Policy Council—and with colleagues in the U.S. Department of State and component agencies in the Department of Homeland Security. The core effort is collaborating to drive policy changes that will attract and retain STEM talent, leading to more predictability in the flow of STEM talent in the United States.

Ms. Nice noted that one of the outstanding superpowers of the United States is being a magnet for talented scientist and engineers. But enhancing predictability is crucial, especially given the volatile uncertainty created for immigration in the prior administration

### BOX 5

## Interim National Security Strategic Guidance

On March 3, 2021, the White House released the Interim National Security Strategic Guidance. It has been issued to convey President Biden's vision for how America will engage with the world, and to provide guidance for departments and agencies to align their actions as the administration begins work on a National Security Strategy.



She stressed that much of the work is focused on policies related to research and development enterprises in academia and industry, which are tied to the National Security Strategic Guidance. The NSF and industry both play an important role in this effort: 90 percent of experimental research and 60 percent of applied STEM development research is funded by companies.

### The Immigration Mismatch

Ms. Nice highlighted that as a result of this successful collaborative effort, new policies were announced in January of 2022. These policies grant permanent resident status for people working on endeavors of national interest.

She noted that this was a major area of concern, as in the last pre-pandemic year, 77,000 petitions were approved by the DHS for advanced degree professionals in STEM and non-STEM, but only 6,500 applicants were awarded residency status for their activities being of national interest.



U.S. Department of Labor statistics show some interesting patterns regarding the mismatch between the need for talent attraction and retention and actual granted residency statuses. Of the 77,000 petitions, the majority of petitions (ca. 46,000) came from India, but only 339 of applicants requested a national interest waiver. However, it is likely there were many more people in critical technology fields amongst these 77,000. This illustrates the unmet demand, as well as the level of uncertainty and lack of predictability.

Similarly, the O1 visa, which is granted to individuals with advanced degrees and extraordinary ability in their fields, also seems underused. The number of O1 visas granted is uncapped and allows grantees to stay in the United States indefinitely in three year increments. About 30,000 people a year receive the O1 visa, but only 2,500 of these are in STEM fields. However, around 1,100 students earn STEM Ph.D.s every year, and 35,000 people come to the United States for post-doctorate positions every year.

Ms. Nice noted that part of the issue is a lack of guidance. National interest immigration has been around for 30 years, but to date, the DHS has not issued any clarification on how it grants this waiver.

### **Concrete Measures to Fix the Mismatch**

A new guidance is supposed to change this status quo. The “Degree Plus” program recognizes the importance of people with advanced degrees in the White House critical technology list. This list relies on authoritative published lists identifying critical and emerging technology subfields (published by OSTP and the National Science and Technology Council), and includes research and development intensive industries.

### **A Collaborative Effort to Ensure the Fields of Interest Remain Up to Date**

Two policies that were launched in January relate to when students can stay in the United States for three years after earning their degree (J1 and DHS H1 visa). This includes multidisciplinary fields (such as bioenergy and climate science), and fields that have expanded recently (data science and cloud computing).

In the future, associations of higher education will be able to nominate fields that are gaining national critical importance, which will be reviewed by the DHS on an annual basis and updated as appropriate.

### **Early Career STEM Research Initiative and Opportunities for Council Collaboration**

Universities are already using the J1 visa extensively—it allows grantees to remain in the United States for periods of up to five years. But grantees could be going to work for companies as well.

Ms. Nice explained that one of the efforts by the Biden-Harris Administration under this [Early Career STEM Research Initiative](#) is to encourage companies to host researchers.

There are no prior petition requirements and the process for approval goes through the Department of State’s designated sponsors.

Ms. Nice noted that a group such as the Council could work with educational institutions to create hubs for particular areas of science in different regions. The Council also could facilitate programs between educational institutions and companies to host international researchers.

Such an effort could be done in industry-university collaborations. A lot of post-doctorate fellows come on J1 visas, which are granted for a period of five years, but a science and engineering fellowship usually only lasts two to three years. Universities could work with companies to place fellows for the rest of their allowed visa time in a related research or application position.



## Balancing Talent Attraction and Retention with Research Security



**Dr. Rebecca Lynn Keiser**  
Chief of Research Security  
Strategy and Policy  
National Science Foundation

Dr. Rebecca Lynn Keiser, Chief of Research Security Strategy and Policy, National Science Foundation, discussed how the administration is trying to navigate attracting and retaining skilled labor in critical technology areas, while also maintaining research security.

She stressed that research security is not about placing barriers to research immigration, but instead about safeguarding the research ecosystem while continuing to attract STEM talent. She noted that the recent studies of foreign STEM students indicating significant fear about not being welcomed in the United States are very concerning.

### Differentiating Malign Foreign Influence from Research Collaboration

Dr. Keiser highlighted that differentiating malign foreign influence from positive international collaboration is imperative. However, many of these discussions have to do with global competitors and adversaries. She warned that the United States should not be naive and be cognizant of the long arm of these governments.

She proceeded to highlight several ways in which the NSF attempts to do so:

#### *Collaboration with Allies on International Research Security Issues*

She mentioned how it can be tricky to navigate collaborations even with allies, because they are also competitors in attracting talent. For example, the

time a student studies in Canada counts towards citizenship, which is a powerful motivator to remain in Canada.

#### *Analytics for Research Security*

The NSF tried to identify anomalies that impact researchers and determine where foreign affiliations and funding were not disclosed. Data shows that eight to ten percent of funded awardees are not disclosing their full funding sources, and likely the majority of the non-disclosed funding sources are Chinese affiliations. This is a key issue not just for universities, but also for researchers in private companies.

Foreign talent recruitment programs are a big issue. The NSF is therefore working with Congress to **differentiate between beneficial programs** ([Alexander von Humboldt Foundation](#), for instance) and **malign foreign talent recruitment** programs. Dr. Keiser noted that the NSF is open to collaboration on how parameters for these programs can be defined.

Additionally, the NSF **works with universities and the private sector to identify research security risks** and build trust within their communities to come up with clear factors for international collaboration and attracting foreign talent. She noted that this also allows for collaboration with organizations such as the Council to research security programs and how to refine data collection for risk assessment.

## Discussion with the TLSI Community

Dr. Jennifer Lodge, Vice President for Research and Innovation, Duke University, noted that the fear described in surveys of foreign-born scientists is a key barrier to innovation and harvesting the full potential of talent and international research collaborations. She also asked Dr. Keiser if there is any discussion about creating models where people can disclose what affiliations they had in the past without ruining their careers moving forward.

Dr. Keiser reported that new implementation guidance came out in 2022 to establish a path to correct mistakes. However, there cannot be guarantees of zero consequences for disclosures of past affiliations or mistakes. Each case has to be evaluated, although no one is interested in long prosecutions. The key interest is protecting American IP and the U.S. government.

Mr. Evans thanked Ms. Nice and Dr. Keiser for their presentations and noted that their presentations identified several ways in which the Council, and the TLSI in particular, can be involved.

### **Streamlining a Bureaucracy for Success—the Brazilian Patent and Trademark Agency (INPI)**



**Dr. Claudio Vilar Furtado**  
President  
Brazilian Patent and Trademark  
Agency (INPI)

Mr. Evans introduced Dr. Claudio Vilar Furtado, President, Brazilian Patent and Trademark Agency (INPI). He highlighted that the Council has had a longstanding, successful partnership with Brazil and INPI, exchanging ideas on accelerating innovation opportunities between the United States and Brazil. He noted that Dr. Furtado has been the President of INPI for two years and was brought in by the new administration in Brazil to streamline the processes at INPI and eliminate barriers.

Dr. Furtado thanked Mr. Evans for the introduction and added that INPI has been a partner of the Council since 2007 and is also in partnership with the Council's global sister organization, the GFCC.

### **Patent Application Backlog and How INPI Set Out to Streamline Processes and Increase Productivity**

Framing his remarks, Dr. Furtado shared that he was invited to take over what the new administration considered to be one of the most problematic agencies of the government. He contended that the issue of intellectual property had been almost forgotten by the previous administrations for more than 15 years, and that upon assuming his position at INPI, he was faced with a backlog of 160,000 patent applications that had been waiting for eight and a half years on average. He noted that this was the result of a greater problem: The agency required a fundamental change to its internal culture. Staff in the agency thought their main purpose was to deny the registration of patents, because the majority were applied for by large multinational corporations, and there were concerns of temporary monopolies.

Dr. Furtado was faced with the question of what a 21st century intellectual property agency looks like in terms of international investments, protection of patents, direct foreign investment, etc.

They started work to stimulate a new wave of patent registrations and created task forces directed at managing internal strategic programs, including working through the backlog.

Within two years, 80 percent of the backlog had been addressed, and the rest, Dr. Furtado explained, will be done this year.

He noted that dealing with such a sizable backlog meant increasing productivity by revamping methods and operations. The new operations required a 30 percent productivity increase, all while the majority of the agency employees were working from home. In this process, INPI also relied more extensively on IT and streamlined processes by granting digital access to INPI services.

This change mobilized more than 2,000 companies, especially SMEs, who were additionally supported by qualified tele-mentoring for the submission of patent applications to more than 250 clients.

Overall, INPI's productivity rose by 38 percent. Productivity in trademark decision making rose by 58 percent, with trademark decisions now taking an average of 9 months, and this year it is expected that 420,000 trademark applications will be granted. While this still is in no way comparable to countries like the United States (six million trademarks a year) or China (seven million), it is a significant improvement over previous years.

Dr. Furtado added that they also started a program for business to work directly with innovation clusters in the country by developing partnerships with other agencies and private sector organizations. This program included the largest and most innovative states in Brazil, and increased operations by more than 60 percent for IP registrations in the agency.

Dr. Furtado emphasized that he strongly believes in IP as a pillar of innovation in the country, and incorporating this belief into the national strategy remains the biggest challenge.

## International Collaboration

As part of Dr. Furtado's restructuring of INPI, he also pushed to improve the agency's international agenda and, in particular, collaborations with organizations across Europe. A new program with Denmark focused on agriculture, health, climate technology, and clean energy involves universities and companies in both countries. Nine business projects were undertaken by companies and universities under this transnational collaboration.

Additionally, INPI is working with the U.S. Patent and Trademark Office director and involved him in the collaborative project with Denmark. This effort will be led by INPI and will result in a planned major revision of intellectual property law from the 1990s by the Brazilian Congress and Supreme Court.

# Co-chairs Closing Remarks and Conclusion

Dr. Walker thanked participants for the vibrant discussion and summarized key issue that stood out to him from the presentations during the morning and afternoon sessions:

1. The United States should increase efforts to exchange best practices with other allied innovation nations, especially in Europe.
2. The United States needs to rethink its innovation talent and education supply chain to determine how the innovation ecosystem can be set up for success.
3. The United States needs a long-term vision for these efforts that goes across party lines.

Dr. Hindman agreed with Dr. Walker and noted that the findings from today's session are a great starting point to determine where the group wants to invest time and energy to drive these issues.

He suggested that the Council develop a poll for the TLSI community to see which issues and areas are of particular interest to the group and determine passions for a unified focus of the group.

Mr. Evans agreed and announced that there would be follow-up coming after this session. He thanked external participants for their contributions and reminded the TLSI community about the next Competitiveness Watch webinar on June 16, 2022, as well as the next in-person Fall Dialogue on November 10, 2022, in Washington, D.C.

# Participants

## TLSI MEMBERS & GUESTS

**Dr. Karen Burg**

Associate Vice President for Research, Office of Research  
University of Georgia

**Dr. Tomás Díaz de la Rubia**

Vice President for Research and Partnerships  
University of Oklahoma

**Dr. Thomas Gardner**

Chief Technology Officer  
HP Federal

**Dr. Jeanne Hossenlopp**

Vice President for Research and Innovation  
Marquette University

**Dr. Jennifer Lodge**

Vice President for Research & Innovation  
Duke University

**Dr. Sally Morton**

Executive Vice President, ASU Knowledge Enterprise  
Arizona State University

**Mr. Dan Newman**

Senior Technical Fellow, VTOL Systems  
Boeing

**Dr. Anthony Peurrung**

Deputy Director for Science and Technology  
Pacific Northwest National Laboratory

**Mr. Toby Redshaw**

CEO, Verus Advisory, and  
Senior Fellow

**Mr. Dan Scott**

Senior Vice President of Technology, Engineering, & Manufacturing  
Northrup Grumman

**Dr. John Smee**

Vice President, Engineering  
Qualcomm

**Ms. Mary Snitch**

Senior Manager, Global S&T Industry Engagement  
Lockheed Martin

**Dr. Bogdan Vernescu**

Vice Provost for Research  
Worcester Polytechnic Institute

**Dr. Jay Walsh**

Vice President for Economic Development and Innovation  
University of Illinois System

**Dr. James Weyhenmeyer**

Vice President for Research and Economic Development  
Auburn University

## COUNCIL TEAM

**Mr. Steve Jost**

Senior Vice President  
Subject Matter

**Mr. Mike Nelson**

Senior Director  
Subject Matter

**Ms. Yasmin Hilpert**

Senior Policy Director  
Council on Competitiveness

**Ms. Kendall Carter**

Account Associate  
Subject Matter



# Speaker Bios

## Dr. Claudio Vilar Furtado

President

National Institute of Industrial Policy (INPI), Brazil



On January 8, 2019, the Brazilian Economy Ministry announced that economist Cláudio Vilar Furtado will be the new President of the Brazilian Patent Office (INPI). As part of a comprehensive reshuffle started by the new government, the Ministry of Industry, Foreign Trade and Services, to which INPI

was formerly attached, was recently incorporated by the Economy Ministry.

Dr. Furtado holds a degree in Engineering from the Federal University of Rio de Janeiro (UFRJ), a Master's degree in Business Administration from FGV, as well as a Master's Degree in Business Economics and a PhD in Finance from the University of Chicago. He also holds a PhD in Administration from the School of Business Administration of São Paulo (EAESP-FGV).

Dr. Furtado has been a professor at EAESP -FGV since 1974, teaching undergraduate and postgraduate programs in the areas of Investment Strategy, Corporate Finance, Private Equity and Venture Capital. In 2003, he created the Private Equity and Venture Capital Research Center at FGV, of which he is the current executive director.

During his career, Dr. Furtado held positions as executive vice president of ABC-Bull, financial director of ABC Sistemas Eletrônicos and as director of business development at ELEBRA S.A.

Since 1994, Dr. Furtado has been a managing partner of CVF Finanças e Investimentos Ltda. Financial Strategy and Applied Economics consulting. He is a board member of NORSA-Refrigerantes do Nordeste S.A., a subsidiary of The Coca Cola Co. and the Jereissati Nordeste Group and Atento Holding, a Telefonica Group company based in Madrid.

## Dr. Rebecca Lynn Spyke Keiser

Chief of Research Security Strategy and Policy  
National Science Foundation



Dr. Rebecca Spyke Keiser is the Chief of Research Security Strategy and Policy (CORSSP) at the National Science Foundation (NSF).

Keiser is the first CORSSP, a position established in March 2020 to ensure the security of federally funded research while maintaining open international collaboration. In this role, Keiser provides the NSF director with policy advice on all aspects of research security strategy. She also leads NSF's efforts to develop and implement efforts to improve research security and the agency's coordination with other federal agencies and the White House.

Until March 2020, Keiser was the head of the Office of International Science & Engineering (OISE) at NSF. Keiser had served as head of OISE since coming to NSF in 2015. The office promotes an integrated, international strategy and manages internally focused programs that are innovative, catalytic and responsive to a broad range of NSF and national interests.

Prior to NSF, she was a special advisor to the National Aeronautics and Space Administration (NASA) administrator and an executive-in-residence at American University. She held several positions with NASA, including associate deputy administrator for strategy and policy, associate deputy administrator for policy integration, and executive officer to the deputy administrator.

Keiser also served as assistant to the director for international relations at the White House Office of Science and Technology Policy, where she provided policy guidance to the president's science advisor. Her experience covers science and technology policy, agreements and other cooperative efforts. She is a board member of Women in Aerospace and a member of the American Academy for the Advancement of Science. She has a bachelor's degree in Japanese studies from Wellesley College; a master's degree in politics of the world economy from the London School of Economics; and a doctorate in international studies from the University of South Carolina. She speaks Japanese and Spanish.

### **Ms. Amy M. Nice**

Assistant Director for International S&T Workforce Office of Science and Technology Policy, White House



Amy M. Nice joined the White House Office of Science and Technology Policy in June 2021 as an Assistant Director. She has more than 30 years of experience—as an immigration lawyer focused on a wide variety of employment-based, immigration-related issues as a practitioner for 20 years, and for the last 12 years, as a policy analyst and advocate. In her role as OSTP's Assistant Director for International Science and Technology Workforce, she takes the lead on STEM immigration and primarily focuses on agency policy shifts that will help the U.S. attract and retain more international STEM talent.

Since 2010, Ms. Nice's policy work has included working with coalitions of higher education and business on high-skilled immigration policy, service as an attorney in the DHS Office of the General Counsel at the end of the Obama administration where she worked on employment-based immigration regulations and policy, and before that nearly five years as the Executive Director for Immigration Policy at the U.S. Chamber of Commerce where she worked extensively on S. 744, the bipartisan comprehen-

Since 2010, Ms. Nice's policy work has included working with coalitions of higher education and business on high-skilled immigration policy, service as an attorney in the DHS Office of the General Counsel at the end of the Obama administration where she worked on employment-based immigration regulations and policy, and before that nearly five years as the Executive Director for Immigration Policy at the U.S. Chamber of Commerce where she worked extensively on S. 744, the bipartisan comprehen-

sive immigration bill that passed the Senate in June 2013, and various other legislative efforts to reform the nation's immigration statutes.

Before devoting her work to immigration policy, Ms. Nice was Of Counsel at the Washington, D.C., law firm of Dickstein Shapiro (now Blank Rome) from 1989 to 2010, where she led the firm's varied immigration practice. While she was primarily engaged on employment-based immigration matters, she also worked closely on pro bono projects with Catholic Charities on developing a case-intake system for immigrant crime victims and with the Immigrant Legal Resource Center on naturalization.

### **Dr. Phil Root**

Director, Strategic Technology Office  
DARPA



Army Lt. Col. (ret) Philip Root, PhD, was named director of the Strategic Technology Office (STO) in February 2022. He previously served as DSO's deputy director and acting director from June 2019 until moving to STO. He previously served as program manager within the DARPA's

Tactical Technology Office (TTO) where he explored the intersection of AI, autonomy, and military operations. His former TTO programs include the Squad X program, Urban Reconnaissance through Supervised

Autonomy (URSA), the ALIAS aircrew autonomy program, the Mobile Force Protection counter-UAS program, the Underminer tactical tunneling program, and the DSO Fast Lightweight Autonomy (FLA) program. He maintains responsibility for the legal, moral, and ethical (LME) analysis of the URSA program as an exemplar for in-depth LME analysis of an autonomous system.

Before coming to DARPA, Root was the director of the Center for Innovation and Engineering at the United States Military Academy at West Point where he oversaw cadet and faculty research in support of Army operations. As a research and development officer, Root has deployed to Afghanistan developing and implementing the hardware and software needed to support cloud-based military intelligence analytics. He served two years as an Astronaut Office support engineer at the Johnson Space Center where he had oversight responsibilities for the booster and launch abort system of the Constellation program intended to return Americans to the Moon. Root spent nearly the first decade of his career as an Apache helicopter pilot in Germany and Korea. He is a graduate of the United States Military Academy, and he received his Master of Science and doctorate from MIT at the Laboratory for Information and Decision Systems (LIDS).

# Council on Competitiveness Members, Fellows and Staff

## BOARD

### Chairman

**Mr. Brian Moynihan**  
President & CEO  
Bank of America  
[Co-Chair, National Commission](#)

### Business Vice-chair

**Ms. Janet Foutty**  
Chair of the Board  
Deloitte LLP  
[National Commissioner](#)

### University Vice-chair

**Ms. Joan T.A. Gabel,**  
President  
University of Minnesota  
[National Commissioner](#)

### Labor Vice-chair

**Mr. Lonnie Stephenson**  
International President  
IBEW  
[Co-Chair, National Commission](#)

### Chairman Emeritus

**Mr. Charles O. Holliday, Jr.**  
Council on Competitiveness  
[National Commissioner](#)

**The Honorable Deborah L. Wince-Smith**  
President & CEO  
Council on Competitiveness  
[Co-Chair, National Commission](#)

## EXECUTIVE COMMITTEE

**Mr. Thomas R. Baruch**  
Managing Member  
Baruch Future Ventures  
[National Commissioner](#)

**Dr. Gene D. Block**  
Chancellor  
University of California, Los Angeles

**Mr. William H. Bohnett**  
President  
Whitecap Investments

**Mr. Walter Carter, Jr.**  
President  
University of Nebraska

**Dr. James Clements**  
President  
Clemson University

**Mr. Jim Clifton**  
Chairman and Chief Executive Officer  
Gallup  
[National Commissioner](#)

**Mr. Mark Crosswhite**  
Chairman, President and CEO  
Alabama Power Company  
[National Commissioner](#)

**Dr. Michael M. Crow**  
President  
Arizona State University  
[National Commissioner](#)

**Dr. John J. DeGioia**  
President  
Georgetown University

**Dr. Suresh V. Garimella**  
President  
University of Vermont

**Dr. Sheryl Handler**  
President & Chief Executive Officer  
Ab Initio  
[National Commissioner](#)

**The Honorable Shirley Ann Jackson**  
President  
Rensselaer Polytechnic Institute

**Dr. Farnam Jahanian**  
President  
Carnegie Mellon University

**Dr. Mehmood Khan**  
Chief Executive Officer  
Hevolution Foundation  
[National Commissioner](#)

**Dr. Pradeep K. Khosla**  
Chancellor  
University of California, San Diego  
[National Commissioner](#)

**Mr. John May**  
Chief Executive Officer  
Deere & Company

**Mr. James B. Milliken**  
Chancellor  
University of Texas System

**Mr. Nicholas T. Pinchuk**  
Chairman, President, and  
Chief Executive Officer  
Snap-on Incorporated

**Prof. Michael E. Porter**  
Bishop William Lawrence University Professor  
Harvard Business School

**Mr. Steven Stevanovich**  
Chairman & Chief Executive Officer  
SGS Global Holdings  
[National Commissioner](#)

**Ms. Randi Weingarten**  
President  
American Federation of Teachers, AFL-CIO

**Dr. Harry L. Williams**  
President & CEO  
Thurgood Marshall College Fund

**Dr. David Kwabena Wilson**  
President  
Morgan State University

**Dr. W. Randolph Woodson**  
Chancellor  
North Carolina State University  
[National Commissioner](#)

**Mr. Paul A. Yarossi**  
Executive Vice President  
HNTB Holding Ltd.

**Dr. Robert J. Zimmer**  
Chancellor  
University of Chicago



**GENERAL MEMBERS****Mr. Jonathan Alger**

President  
James Madison University

**Dr. Tony Allen**

President  
Delaware State University

**Dr. Michael Amiridis**

Chancellor  
University of Illinois at Chicago

**Dr. Joseph E. Aoun**

President  
Northeastern University

**Dr. Dennis Assanis**

President  
University of Delaware  
[National Commissioner](#)

**Dr. Eric Barron**

President  
Pennsylvania State University

**The Honorable Sandy K. Baruah**

Chief Executive Officer  
Detroit Regional Chamber

**Dr. Mark Becker**

Executive in Residence  
Georgia State University  
[National Commissioner](#)

**Dr. Stuart R. Bell**

President  
The University of Alabama

**Dr. Richard Benson**

President  
University of Texas at Dallas

**Mr. Lee C. Bollinger**

President  
Columbia University

**Dr. Robert A. Brown**

President  
Boston University

**The Honorable Sylvia M. Burwell**

President  
American University

**Mr. Walter Carter, Jr.**

President  
University of Nebraska

**Mr. John Chachas**

Managing Partner  
Methuselah Advisors  
[National Commissioner](#)

**The Honorable Mitchell E. Daniels, Jr.**

President  
Purdue University

**Mr. Ernest J. Dianastasis**

Managing Director  
The Precisionists, Inc.

**Dr. Daniel Diermeier**

Chancellor  
Vanderbilt University

**Mr. Jeff Donofrio**

President and Chief Executive Officer  
Business Leaders for Michigan

**Dr. Taylor Eighmy**

President  
University of Texas at San Antonio  
[National Commissioner](#)

**Dr. Greg Fenves**

President  
Emory University  
[National Commissioner](#)

**Mr. Robert Ford**

President and Chief Operating Officer  
Abbott

**Dr. Julio Frenk**

President  
University of Miami

**Dr. W. Kent Fuchs**

President  
University of Florida  
[National Commissioner](#)

**The Honorable Patrick D. Gallagher**

Chancellor  
University of Pittsburgh

**Dr. E. Gordon Gee**

President  
West Virginia University

**Mr. Gregory P. Hill**

President and Chief Operating Officer  
Hess Corporation  
[National Commissioner](#)

**Mr. G. Michael Hoover**

Chairman, President, and CEO  
Sundt Construction  
[National Commissioner](#)

**Dr. Eric Isaacs**

President  
Carnegie Institution for Science

**The Honorable Steven Isakowitz**

President and CEO  
The Aerospace Corporation  
[National Commissioner](#)

**Rev. John I. Jenkins, Sr.**

President  
University of Notre Dame

**Dr. Robert E. Johnson**

President  
Western New England University  
[National Commissioner](#)

**Dr. Eric Kaler**

President  
Case Western Reserve University

**Dr. Mark E. Keenum**

President  
Mississippi State University

**Dr. Timothy L. Killeen**

President  
University of Illinois System  
[National Commissioner](#)

**Dr. Richard H. Linton**

President  
Kansas State University

**Dr. Michael Lovell**

President  
Marquette University

**Dr. Larry Marshall**

Chief Executive  
Commonwealth Scientific and Industrial Research  
Organisation (CSIRO)

**Dr. Ronald Mason, Jr.**  
President  
University of the District of Columbia

**Dr. Gary S. May**  
Chancellor  
University of California, Davis  
[National Commissioner](#)

**Mr. Sean McGarvey**  
President  
North America's Building Trades Unions

**Dr. Jonathan McIntyre**  
President  
Motif FoodWorks, Inc.  
[National Commissioner](#)

**Brig. Gen. John Michel**  
Executive Director  
Skyworks Global

**Mr. Jere W. Morehead**  
President  
University of Georgia

**Dr. Om Nalamasu**  
President  
Applied Ventures, LLC  
[National Commissioner](#)

**Dr. Scott Parazynski**  
Founder and CEO  
Fluidity Technologies  
[National Commissioner](#)

**Mr. Joshua Parker**  
Chief Executive Officer  
Ancora  
[National Commissioner](#)

**Dr. Harris Pastides**  
Interim President  
University of South Carolina

**Mr. Nolan Pike**  
President and CEO, North America  
Electrolux  
[National Commissioner](#)

**Dr. Darryll Pines**  
President  
University of Maryland  
[National Commissioner](#)

**Lt. Gen. Michael T. Plehn, USAF**  
President  
National Defense University

**Dr. Jason Providakes**  
President and CEO  
The MITRE Corporation

**Mr. John Pyrovolakis**  
Founder and CEO  
Innovation Accelerator Foundation

**Dr. L. Rafael Reif**  
President  
Massachusetts Institute of Technology

**Mr. Alex Rogers**  
President, Qualcomm Technology Licensing  
Qualcomm  
[National Commissioner](#)

**Dr. Rodney Rogers**  
President  
Bowling Green State University

**Dr. Clayton Rose**  
President  
Bowdoin College

**VADM John Ryan, USN (Ret.)**  
President & Chief Executive Officer  
Center for Creative Leadership

**Dr. Timothy D. Sands**  
President  
Virginia Polytechnic Institute and State University

**Mr. John Sharp**  
President  
The Texas A&M University System

**Mr. Frederick W. Smith**  
Executive Chairman  
FedEx Corporation

**Ms. G. Gabrielle Starr**  
President  
Pomona College

**Dr. Elisa Stephens**  
President  
Academy of Art University  
[National Commissioner](#)

**Dr. Elizabeth Stroble**  
Chancellor  
Webster University

**Dr. Kumble Subbaswamy**  
Chancellor  
University of Massachusetts Amherst

**Mr. Sridhar Sudarsan**  
Chief Technology Officer  
SparkCognition, Inc.  
[National Commissioner](#)

**Mr. Andrew Thompson**  
Co-Founder and Board Member  
Summit Schools  
[National Commissioner](#)

**Dr. Satish Tripathi**  
President  
University at Buffalo

**Dr. Martin Vanderploeg**  
President and CEO  
Workiva  
[National Commissioner](#)

**Mr. Olin L. Wethington**  
CEO & Co-Founder  
Graham Biosciences LLC  
[National Commissioner](#)

**Dr. Kim Wilcox**  
Chancellor  
University of California, Riverside  
[National Commissioner](#)

**Dr. Wendy Wintersteen**  
President  
Iowa State University  
[National Commissioner](#)

**Mr. John Young**  
Founder  
Council on Competitiveness

#### NATIONAL LAB PARTNERS

**Dr. Steven F. Ashby**  
Director  
Pacific Northwest National Laboratory  
[National Commissioner](#)

**Dr. Kimberly Budil**  
Director  
Lawrence Livermore National Laboratory

**Dr. Paul Kearns**  
Director  
Argonne National Laboratory  
[National Commissioner](#)

**Dr. Thomas Mason**  
Director  
Los Alamos National Laboratory  
[National Commissioner](#)

**Dr. James Peery**  
Director  
Sandia National Laboratories  
[National Commissioner](#)

**Dr. John Wagner**  
Director  
Idaho National Laboratory  
[National Commissioner](#)

**Dr. Michael Witherell**  
Director  
Lawrence Berkeley National Laboratory  
[National Commissioner](#)

**Dr. Thomas Zacharia**  
Director  
Oak Ridge National Laboratory  
[Co-Chair, National Commission](#)

#### CORPORATE PARTNERS

HP Federal

Intel Corporation

Lockheed Martin Corporation

PepsiCo, Inc

#### UNIVERSITY PARTNERS

University of California, Irvine

University of Michigan

University of Pennsylvania

University of Utah

**NATIONAL AFFILIATES**

**Dr. Dean Bartles**  
Chief Executive Officer and President  
Manufacturing Technology Deployment Group

**Ms. Caron Ogg**  
President  
ARCS Foundation, Inc.

**Dr. David Oxtoby**  
President  
American Academy of Arts and Sciences

**DISTINGUISHED FELLOWS**

**The Honorable France Córdova**  
Former Director  
National Science Foundation

**The Honorable Paul Dabbar**  
Chairman and CEO  
Bohr Quantum Technologies

**Adm. James G. Foggo, USN (Ret.)**  
Former Commander, U.S. Naval Forces Europe  
and Africa and Commander, Allied Joint Force  
Command, Naples, Italy

**Dr. William H. Goldstein**  
Former Director  
Lawrence Livermore National Laboratory

**The Honorable Bart J. Gordon**  
Partner  
K&L Gates LLP

**Mr. Thomas Hicks**  
Principal  
The Mabus Group

**Dr. Klaus Hoehn**  
Former Senior Advisor—Innovation & Technology to  
the Office of the Chairman, and  
Vice President, Advanced Technology &  
Engineering  
Deere & Company

**Dr. Paul J. Hommert**  
Former Director  
Sandia National Laboratories

**Dr. Lloyd A. Jacobs**  
Former President  
University of Toledo

**Dr. Ray O Johnson**  
CEO  
Technology Innovation Institute

**The Honorable Martha Kanter**  
Executive Director  
College Promise Campaign

**The Honorable Alexander A. Karsner**  
Senior Strategist  
X: Alphabet's Moonshot Factory

**The Honorable Steven E. Koonin**  
Professor, Department of Civil and Urban  
Engineering, Tandon School of Engineering  
New York University

**The Honorable Michael Kratsios,**  
Former Acting Under Secretary of Defense for  
Research and Engineering, and Former Chief  
Technology Officer of the United States, and  
Managing Director, Scale AI

**Mr. R. Brad Lane**  
Co-Founder and Chief Executive Officer  
Ridge-Lane Limited Partners

**The Honorable Alan P. Larson**  
Senior International Policy Advisor  
Covington & Burling LLP

**Mr. Edward J. McElroy**  
Board of Directors, Executive Committee of Ullico  
AFL-CIO

**Dr. Luis M. Proenza**  
President Emeritus  
University of Akron

**The Honorable Kimberly Reed**  
Former President  
Export-Import Bank of the United States

**The Honorable Branko Terzic**  
Managing Director  
Berkeley Research Group

**Dr. Anthony J. Tether**  
Former Director  
Defense Advanced Research Projects Agency  
(DARPA)

**Dr. Thomas M. Uhlman**  
Founder and Managing Partner  
New Venture Partners, LLC

**Dr. Mohammad Zaidi**  
Strategic Advisory Board Member  
Braemar Energy Ventures

**SENIOR FELLOWS**

**Mr. Bray Barnes**  
Director  
Global Security & Innovation Strategies

**Ms. Jennifer S. Bond**  
Former Director  
Science and Engineering Indicators Program  
National Science Foundation

**Dr. Thomas A. Campbell**  
Founder & President  
FutureGrasp, LLC

**Mr. C. Michael Cassidy**  
Director, Emory Biomedical Catalyst  
Emory University

**Ms. Dona L. Crawford**  
President Emeritus  
Livermore Lab Foundation

**Mr. Dominik Knoll**  
President & CEO  
AVA Ventures

**Mr. Alex R. Larzelere**  
President  
Larzelere & Associates

**Mr. Abbott Lipsky**  
Partner  
Latham & Watkins LLP

**The Honorable Julie Meier Wright**  
Strategic Advisor  
Collaborative Economics

**Mr. Mark Minevich**  
Principal Founder  
Going Global Ventures

**Dr. Rustom Mody**  
CEO  
Vintech NM

**Ms. Michelle Moore**  
Chief Executive Officer  
Groundswell

**Mr. Toby Redshaw**  
CEO  
Verus Advisory, LLC

**Ms. Jody Ruth**  
CEO  
Redstones LLC

**The Honorable Reuben Sarkar**  
President & CEO  
American Center for Mobility

**Mr. W. Allen Shapard**  
Senior Director, Chair of Public Engagement  
Strategies  
APCO Worldwide

**Ms. Maria-Elena Tierno**  
Senior Business Manager  
Constellation Energy

**Dr. William Wescott**  
Managing Partner  
BrainOxygen, LLC

**Dr. David B. Williams**  
Monte Ahuja Endowed Dean's Chair &  
Dean of the College of Engineering  
The Ohio State University

**STAFF**

**Mr. Chad Evans**  
Executive Vice President & Secretary and Treasurer  
to the Board

**Mr. William Bates**  
Senior Advisor

**Ms. Carol Anne Meares**  
Senior Advisor

**Ms. Marcy Jones**  
Special Assistant to the President & CEO and  
Office Manager

**Ms. Yasmin Hilpert**  
Senior Policy Director



**Compete.**

Council on  
Competitiveness

## Contact

For more information, please contact:

### Mr. Chad Evans

Executive Vice President  
[cevans@compete.org](mailto:cevans@compete.org)

### Council on Competitiveness

900 17th Street, NW  
Suite 700  
Washington, D.C. 20006

## Join the Conversation



@CompeteNow



/USCouncilonCompetitiveness



/company/council-on-competitiveness/



CompeteTV



Compete.org

## About the Council on Competitiveness

For more than three decades, the Council on Competitiveness (Council) has championed a competitiveness agenda for the United States to attract investment and talent, and spur the commercialization of new ideas.

While the players may have changed since its founding in 1986, the mission remains as vital as ever—to enhance U.S. productivity and raise the standard of living for all Americans.

The members of the Council—CEOs, university presidents, labor leaders and national lab directors—represent a powerful, nonpartisan voice that sets aside politics and seeks results. By providing real-world perspective to Washington policymakers, the Council's private sector network makes an impact on decision-making across a broad spectrum of issues—from the cutting-edge of science and technology, to the democratization of innovation, to the shift from energy weakness to strength that supports the growing renaissance in U.S. manufacturing.

The Council's leadership group firmly believes that with the right policies, the strengths and potential of the U.S. economy far outweigh the current challenges the nation faces on the path to higher growth and greater opportunity for all Americans.