



National Commission on Innovation & Competitiveness Frontiers

Mountain West Innovation Summit

University of Wyoming
June 21-22, 2022



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Introduction

On June 21-22, 2022, the Council on Competitiveness (Council) held the Mountain West Innovation Summit, bringing together more than 200 participants from across the country from academia, industry and national laboratories to benchmark national and regional innovation best practices, network with peers to seek partnerships, and expand America's regional innovation geography.

Together with co-hosts and National Commissioners Dr. Ed Seidel, President, University of Wyoming; Mr. Gregory P. Hill, Chairman and COO, Hess Corporation; and Dr. John Wagner, Director, Idaho National Laboratory, the Council engaged its National Commissioners and regional leaders in key discussions laying the groundwork for the next phase of the [National Commission on Innovation & Competitiveness Frontiers](#), which will focus on the future of sustainability, deploying disruptive tech at scale, place-based innovation, and the future of work and the workforce.

Why the Mountain West?

The State, Regional, National, and Global Innovation Imperative

The U.S. economy is facing an inflection point. Multiple technology revolutions are unfolding and converging at a rapid pace, and the nation's ability to swiftly reorganize its economy to capitalize on this creative destruction will dictate whether the United States remains the world's leader in innovation for generations to come. Recent events—including the COVID-19 pandemic, the war in Ukraine, the ongoing effects of climate change, and supply chain disruptions, among many others—have only hastened the pace of change and heightened the importance of rising to the occasion to produce concrete recommendations and action steps for the private and public sectors.

As the world enters this new era of technological transformation, the United States is vying for global leadership in an increasingly multipolar and complex landscape that spans towns and cities, counties, states, regions, and the national as a whole.

But, at the macro level, this includes, most significantly, a rising strategic competitor in China that seeks to build capabilities in science, technology, and innovation to rival the United States and write the global rules of the next economy in its favor. And, it also includes many other nations seeking to capitalize on game-changing innovations that can originate anywhere, especially in an increasingly digital world.

Why the Mountain West? Why Wyoming?

The University of Wyoming in Laramie was founded in 1886 as a land grant research institution. As the state's foremost major research university, it has played a crucial role in making Wyoming the nation's leading energy exporter. Its focus on agriculture and energy research and development has defined the state's industrial development to date. Thanks to the work of rural research institutions like the University of Wyoming, exponential increases in agricultural output efficiency have been realized. These incredible gains in efficiency illuminate the impact of land grant universities on economic and technological development, and underscore the absolute need to incorporate them into the national innovation ecosystem.

Laramie's roots as a frontier town in the Wild West hardly characterize its dynamic, entrepreneurial background. Although it was initially a hotbed for gun slingers, outlaws, saloons, and many of the classic Western tropes, its pioneering role in the success of the Transcontinental Railroad gave the town life. The railroad infrastructure brought investors and speculators to Wyoming, which ultimately put the state on the forefront of the agriculture industry. This background underpinned the local economy for nearly a century. Today, Wyoming draws outdoors enthusiasts and sportsmen, and is a central player in the oil and gas industry.

At the same time, the foundations of U.S. capacity and capability in science and technology have been slowly eroding, and too few people across the entire nation fully participate in and benefit from the innovation economy.

To secure U.S. leadership, prosperity, and competitiveness in this evolving world order, the nation must think differently about innovation. It must be willing to play a radically different game with different rules and a different mindset about what it will take to compete and win. It must re-imagine the people, places, and models of the innovation ecosystem. And, the nation must tap fully into the potential that exists in all corners of the U.S. economy—including the Mountain West—and promote an “all-of-nation” approach to ensure that the innovation ecosystem fires on all cylinders.

With those considerations in mind, the National Commission on Innovation and Competitiveness Frontiers (Commission) is launching the next phase of its work to re-envision the U.S. innovation ecosystem, and dramatically increase the nation's innovation capacity

and capabilities. During the coming months, starting with the findings and outcomes of the Mountain West Innovation Summit—the start of expanding the geography and demography of the innovation ecosystem—the Commission will initiate a new wave of dialogues that will build on prior work, dive deeper into critical topics, and refresh collective thinking on how the United States can out-innovate and out-compete other nations in the 21st century.

Connecting the Mountain West Innovation Summit to the Commission's Goals

The historic events and developments of the past few years have fundamentally altered the U.S. innovation landscape, heightening urgency around several key challenges, while also opening doors to countless new opportunities. With a cross-sectoral membership composed of organizations at the forefront of American innovation, the Commission is positioned at the nexus of these critical developments and has a distinctive perspective to offer on the many imperatives facing the nation.

Following significant efforts over the past 18 months to engage policy leaders in Washington, D.C., and around the country, the Commission has worked to embed strategic recommendations in significant legislative efforts, such as the recently passed CHIPS and Science Act. Looking forward, the time has come to refresh and expand on recommendations from the 2020 [*Competing in the Next Economy*](#) report to reflect an evolving set of urgent priorities. And the Mountain West Innovation Summit was the first step in articulating this new, second phase of the Commission, orienting the future agenda around four key issues the Mountain West and the entire United States must address to bolster its competitive position in a rapidly changing world:

1. **Rethink and reshape how people produce and consume for a more sustainable future.** The United States needs to identify new ways to sustainably produce, consume and power daily life to lead the world in creating a resilient, more abundant world for future generations.
2. **Accelerate development and deployment of disruptive technology at scale in critical emerging sectors.** The United States must step up innovation in critical emerging technologies and accelerate their application and widespread deployment to support competitiveness in key industries of the future.



Mountain West Innovation Summit Participants at the University of Wyoming.

3. **Adapt to the changing nature of the workforce and workplace.** The United States needs to invest in constant upskilling, reskilling, and broader STEM education efforts to ensure that the national workforce can adapt to automation-driven disruptions, benefit from the digitally-intensive knowledge economy, and keep pace with new modes of work.
4. **Expand the geography and demography of the innovation ecosystem.** The United States must cultivate a more geographically and demographically inclusive innovation ecosystem, leveraging untapped talent in areas around the country and from underrepresented populations.

By addressing challenges and opportunities across these four critical issue areas, the Commission believes it can build on past success, supercharge regional and national innovation engines, boldly confront the many challenges facing the nation and the world at large, and help ensure an American future which is more resilient, more secure, more sustainable, more inclusive, more innovative—and more competitive.



Mountain West Innovation Summit panel at the University of Wyoming.

Painting the Picture of the Mountain West Innovation System

Local Assets and Best Practices to Inform the National Innovation Ecosystem

Opening Conversation with Commission Co-Chairs



Dr. Edward Seidel
President
University of Wyoming
[National Commissioner](#)



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



Introduction

Every region of the United States possesses assets with aspiring inventors, innovators, and entrepreneurs whose creative energy could fuel new opportunities and that can be leveraged to increase regional competitiveness and economic development. The pandemic has created a shift out of the traditional big innovative hubs. The Hon. Deborah L. Wince-Smith noted that, in fact, eight of the 15 fastest growing large cities between 2020 and 2021 were in the Mountain West, adding new regional opportunities for innovation and entrepreneurship. The monthly rate of new business formation in Wyoming nearly doubled from April 2020 to April 2022.

As Congress and the Biden-Harris Administration aim to make generational investments in research and development (R&D) and in the nation's innovation ecosystem—ranging from building up innovation centers to increasing funding for critical technologies and testbeds to bolstering advanced microelectronics manufacturing capacity—the Hon. Wince-Smith added that the Commission is seeking to elevate to national attention local and regional needs, lessons, and best practices.



Dr. Edward Seidel, President, University of Wyoming; the Hon. Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Dr. John Wagner, Director, Idaho National Laboratory.

Optimism in Rural Place-Based Innovation

As the new president of the University of Wyoming, Dr. Edward Seidel has made enhancing Wyoming's innovation capacity a top priority of his administration. Through conversations with leading laboratory directors and work through the university, Dr. Seidel has confirmed the desire of research institutes to bring rural communities into the fold of innovation hubs. For too long, the United States has failed to capitalize on the talent and work ethic of communities outside of the coastal centers of technology and innovation.

Capitalizing on Wyoming's Old and New Assets

As the world prepares for widespread transitions to new energy sources, national leadership in R&D of new energy technologies will be necessary to maintain industrial competitiveness. While Wyoming is a leader in energy production, the transition to new sources of energy will challenge the state to adapt. The coal and oil industries are strong features of Wyoming's economy, but there are many

opportunities for sustainable energy development. While Wyoming is the coal powerhouse of the United States, producing about 40 percent of the nation's coal—which with agriculture and tourism makes up most of the state's economy—Wyoming also holds an abundance of other natural resources, which are currently being studied at the university through the lens of sustainability.

Its vast swaths of flat land allow Wyoming to capture as much sunlight as a state like Arizona, while simultaneously remaining cool in temperature. The combination of sunlight and cool temperatures allows solar panels to capture massive amounts of solar rays, while also running more efficiently than in hotter climates.

The University of Wyoming has acquired thousands of solar panels that produce enough energy to power entire schools on campus. Wyoming's windy climate also indicates tremendous potential in harnessing wind energy on the state's wide plains. Additionally, the DOE's nuclear demonstration facility in Kemmerer represents a plethora of potential partnerships with national laboratories that the university can engage with to further their goals in energy and technology research.

Energy Research as a Regional Opportunity for the Mountain West Region

As one of 17 U.S. Department of Energy (DOE) national laboratories, the Idaho National Laboratory (INL) is on the cutting edge of advanced research. Founded in 1949, the INL was the first facility to test nuclear reactors and pioneered key discoveries in nuclear technology. In fact, every nuclear reactor in existence draws on the research and discoveries made at the laboratory. INL is one of three DOE applied energy laboratories, which all work together closely. The laboratory's top priority is nuclear energy R&D, demonstration, and deployment applied to sustainability and national homeland security, with nearly half of INL's work in the past year geared toward cyber and physical security of critical infrastructure.

“The Mountain West Region has tremendous opportunity for the energy sector—but we need to develop strategy and ideas on how this opportunity can become a reality, and turn this region into a major national energy hub.”

The Hon. Deborah L. Wince-Smith

President & CEO, Council on Competitiveness
National Commission Co-Chair

INL has several developments in place-based innovation within the national laboratory space. Two of the DOE’s advanced reactor demonstration projects are in the Mountain West region, with one in Washington state and another in Kemmerer, Wyoming. INL itself is situated between both projects, creating a robust system of research in the region. In the upcoming year, INL is slated to conduct the first advanced reactor demonstration at the site in four decades. The laboratory is also working with local utilities and power providers in Idaho to build up its infrastructure. In its mission to reach net zero carbon emissions, INL is working with companies to reduce their carbon footprint and develop best practices that can be applied across industries.

Responding to a question from Ms. Kimberly Reed, former Chair, United States Export-Import Bank, and Council Distinguished Fellow about the governmental barriers to nuclear energy development, Dr. John Wagner, Director, Idaho National Laboratory, explained that the conversation surrounding the future of energy production and consumption in the United States often relies too heavily on the success of renewables like wind, solar, and hydropower. Dr. Wagner insists that the debate needs to shift to clean energy sources like nuclear energy. Because of misguided public

perception, legislative neglect and the resulting lack of financing, nuclear energy is an underutilized clean energy source.

While the nuclear demonstration plant in Wyoming is far from completion, the local labor market will receive a significant infusion of jobs from its expansion. Not only for nuclear engineers, but also opportunities for tradesmen and the multitude of professionals needed to construct its advanced infrastructure. Similarly, Washington state’s nuclear demonstration plant, estimated to be completed in 2027–2028, will create job opportunities in manufacturing and invigorate the local economy.

Talent Retention in Wyoming

Wyoming is facing new disruptions as the result of key advances in computing, artificial intelligence, and quantum technology. Considering these impending changes, Dr. Seidel and the University of Wyoming recognize the importance of preparedness. Most of Wyoming’s students leave the state upon graduation. To respond to this migration of talent, the university has prioritized creating an environment that encourages students to remain through an increased focus on entrepreneurship and corporate partnerships.

Wyoming prides itself on the diversity of backgrounds of its population and its work ethic. While the population is incredibly talented, it remains underutilized. Because of its isolation from traditional innovation hubs, Dr. Seidel has focused much of his work at the University of Wyoming on new ways of cultivating talent.

Despite \$50 million in budget cuts to the university upon his arrival, Dr. Seidel has endeavored to create new initiatives to inspire and inform students. A new School of Computing, a campuswide Center for Entrepreneurship and Innovation, and new programs in outdoor recreation and hospitality are a few of his administration’s key initiatives to date.

INL is taking deliberate steps to both attract and prepare talent for careers in scientific discovery. Through working with universities and community colleges, the INL is providing students with opportunities to gain

experience in advanced research. Dr. Wagner added that the redistribution of talent and rise of telework due to COVID-19 has opened up new pools of talent across the country that not only want to live in the Mountain West region, but also have the ability to work from anywhere.

Plans to Accelerate Regional Innovation Capacity and Development

The Hon. Wince-Smith asked Drs. Seidel and Wagner to elaborate on plans to accelerate regional innovation capacity and development. Dr. Seidel noted that he has considered how to deal with the region's lack of urban economies. Building on current relationships with laboratories and strengthening ties between regional innovation hubs will be the key to accelerating innovation in the future.

Dr. Wagner posited that INL must increase regional engagement. In the past, these opportunities were minimal. The recent popularity of telework has given the INL the ability to reach across state lines to build relationships with organizations and governments in states throughout the Mountain West region. As the largest energy exporter in the nation, Wyoming has the special opportunity to not only maintain its energy production excellence, but also strengthen it through deliberate collaboration with regional firms, labs, and organizations.

Strategic Engagements and Partnerships with Workforce and Economic Development Officials

The marketplace for talent is highly competitive. It calls for an active commitment to develop and attract people with the skills to thrive in advanced manufacturing and related fields. The University of Wyoming engages regularly with community college commissioners, workforce development officials, the governor's office, and the Wyoming Business Council to build out the Wyoming Innovation Partnership (see Box 1).

BOX 1

Wyoming Innovation Partnership (WIP)

WIP is an agreement to develop programs that will lay the groundwork of the future economy in Wyoming. These include incubators, entrepreneurship programs, collaborative computing programs, and groups focused on energy development. The university has received \$56 million in funds for WIP in 2022, with an additional \$20 million earmarked for 2023. In addition to in-state efforts, Dr. Seidel has worked to create collaborations with laboratories and universities in neighboring states to devise coordinated plans to build out productive and innovative capacity.

Each entity plays a critical role in the development of the WIP, highlighting the statewide effort to elevate the state's role in the national innovation ecosystem.

The University of Wyoming has also recently launched its Center for Entrepreneurship and Innovation, which focuses on developing corporate partnerships and coordinating them across the university. Dr. Seidel plans to work to implement the program at community colleges across the state as well.

Following a question from Ms. Margaret Donoghue, Country Head U.S., Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), as to what efforts INL is driving to engage with industry, Dr. Wagner explained that the process for private companies to participate in collaboration with national laboratories is complex and time consuming. Luckily, the DOE has programs to expedite this process. The Gateway for Accelerated Innovation in Nuclear serves as a front door to working with national laboratories. The program streamlines the various agreements and red tape that otherwise prevent smaller businesses from participating in this aspect of the innovation ecosystem. At the INL,

“We are building out collaborations across this region—particularly with the Dakotas, Montana, Idaho, Utah, and Colorado—to figure out how to organize our ecosystem.”

Dr. Edward Seidel

President, University of Wyoming
National Commissioner

the National Reactor Innovation Center also helps companies interested in nuclear energy navigate the obstacles to national laboratory collaboration. Furthermore, the INL has developed an organization with a sole focus on industry engagement. They teach companies about what the laboratory can offer and the mechanisms for engagement, as well as working to facilitate a more efficient partnership process. Dr. Wagner noted that such programs are necessary for national laboratories to meet the timelines of industry to be competitive globally.

Regulatory Incentives to Join Advanced Manufacturing with the Energy Renaissance

In the face of immense pressure from global competition, industry must be utilized in concert with university and federal research efforts to optimize the energy transformation. Properly incentivizing firms to invest in new energy technology and research is necessary to bring in sufficient financing and productive capacities to scale up. Tax incentives and land grants will always be tools policymakers can implement to attract firms. Additionally, the Mountain West region's natural resources, such as uranium, provide an advantage to attract businesses involved in enrichment and processing.

“Large companies have the resources to navigate the agreements with national labs. But for a small company, that becomes overwhelming. We are working hard at INL to make it easier and faster.”

Dr. John Wagner

Director, Idaho National Laboratory
National Commissioner

On the policy front, there are several approaches that legislators can take to promote national energy goals. Washington state, for example, has passed a law that requires all electricity be produced by non-carbon emitting sources by 2045. Dr. Wagner noted that while the specific policy may not be beneficial to all states, similar approaches from a policy standpoint can incentivize productive behavior in energy R&D.

The advantages of digitization have given companies the ability to react to market shifts quickly. In particular, energy companies must find ways to grapple with current market conditions while also planning for the future, as the industry landscape is rapidly transforming. Dr. Seidel's administration's creation of the University of Wyoming School of Computing is a sign that the university cares deeply about preparing the next generation of workers for the future job market. Investing in talent in the digital space is a way for universities to generate a workforce that can effectively apply advanced methods for research and analysis. Cultivating this forward-thinking culture in the region will draw in capital and enhance current efforts.

SUMMIT KEYNOTE

Innovation Anywhere, Opportunities Everywhere

NSF's New Directorate to Turbocharge Regions

**Dr. Erwin Gianchandani**

Assistant Director for Technology, Innovation
and Partnerships
National Science Foundation

Dr. Erwin Gianchandani, Assistant Director for Technology, Innovation, and Partnerships, National Science Foundation (NSF), joined the Summit to deliver a keynote speech on the NSF's newest efforts to advance innovation and bring ideas to life. This year, the NSF announced the creation of a new directorate—its first in three decades—focused on Technology, Innovation, and Partnerships (TIP).

Expanding the NSF mission: How the TIP Directorate is Binding Curiosity- and Use-Driven Research

One of the core missions for the NSF is to promote the progress of science, advance the nation's health, prosperity, and welfare, and to secure the national defense—TIP is a natural extension of that mission. The NSF itself implements its mission in all scientific disciplines, from biology, computer science, math and physical sciences, and geosciences, to social and economic sciences.

The NSF's broad focus on both curiosity-driven and use-inspired basic research is a staple in its history. For example, the recent discovery of a black hole in the Milky Way is the culmination of decades of curiosity-driven research that the NSF has been tirelessly working to bring to life.

On the other end of the spectrum, the NSF invested more than \$200 million in hundreds of projects across the country to better understand the molecular structure of the COVID-19 virus to meet the existing needs of the population. Both examples spotlight NSF's role in scientific discovery and the development of solutions to society's material needs.

Accelerating Research Through the New TIP Partnership

NSF projects can take decades before creating real social impact. Part of TIP's purpose is to reduce the time it takes for projects to go from ideation to impact across the spectrum of basic research.

The current pace of scientific discovery is historically unprecedented, largely due to the increased accessibility and volume of data available, as well as enhanced capabilities in emerging technology (AI, quantum, machine learning, etc.). Harnessing the newfound access to data and emerging technologies will give researchers predictive insights that will generate new products and technology with unparalleled speed. TIP allows the NSF to put a spotlight on use-inspired research and the translational work that it has long supported but has not emphasized clearly until this year. It does so by partnering across all NSF directorates, identifying impactful use-inspired research, and then strengthening and scaling that research into real-world applications.

A New Approach to Research and a Focus on the Social Impact

Until TIP's creation, most of the NSF's investments have been in investigator-driven science, undertaken by faculty members and academic institutions. TIP seeks to consider the consumers and users of research products. Dr. Gianchandani views the new directorate as a partnership between the NSF and the broader community that will shape research

“What are the important and pressing societal and economic challenges that we face here and now, and how can we have those drive the research directions and the research agenda through the new directorate at NSF?”

directions in the future. It is a paradigm shift toward demystifying and recontextualizing NSF research as a means to generate greater social impact. Rather than conduct research and push it to market, TIP is a way of bringing the market to the table. Understanding the needs of consumers will allow the NSF to strengthen and accelerate the market pull of its research and refine what it invests in.

In President Joseph R. Biden's FY2023 Budget Request, the NSF will receive a 20 percent increase in allotted funds, with nearly \$500 million going directly to TIP. This is only a first step, however. The NSF is looking to Congress and agencies within the federal government to continue to provide the resources and policy support to deliver on TIP's mission.

Spotlight on Industry Partnerships to Support Lab-to-Market Processes

Partnerships are a foundational building block of TIP. To bring the consumer market to the table, the NSF must collaborate across sectors, industries, and geographic and geopolitical boundaries. Early this year, the NSF announced a partnership with Intel Corporation which will fund 11 new NSF-led Artificial Intelligence Research Institutes. These institutes will facilitate a broader nationwide network that will pursue transformational advances in various economic

sectors—from food security to next-generation edge networks. As part of the partnership, Intel announced it will be investing \$20 billion in chip manufacturing facilities in Ohio, with the NSF providing \$100 million to support semi-conductor design and manufacturing at colleges and universities across the country. Through this effort, the NSF will maintain a particular focus on community colleges, promoting curricular innovation and instructional materials to train the students that will be directly involved in the manufacturing and research processes. Dr. Gianchandani emphasized TIP's prioritization of education and workforce development, which can provide students at all levels the experiential opportunities that attract companies and prepare students to contribute from day one.

The NSF has long supported lab-to-market platforms, and TIP will build on this history. The Small Business Innovation Research (SBIR) program has funded R&D for small businesses since the 1970s. It has also supported entrepreneurial education through the I-CORPS program since the 2010s. Not only does it consider lab-to-market options, but also the innovative pathways to societal adoption writ large through local and state governments and federal agencies.

Boosting Regional Innovation as a Strategy to Increase U.S. Competitiveness

The Regional Innovation Engines (NSF Engines) initiative is the NSF's latest effort to cultivate new innovation ecosystems at the scale of regions across the country. The program will make a special effort to incorporate regions of the country that have not benefitted from the technological booms over the last several decades.

Through the program, Dr. Gianchandani hopes to marry both scientific and technological challenges with societal challenges. AI, quantum, biotech, and

wireless all have functions that can apply to broader issues like climate change, equity, critical infrastructure, and much more. Viewing science and technology through the lens of social impact gives TIP a bidirectional focus. It can choose to identify challenges and research applications for emerging technology or match functions of the technology with regional challenges.

Each side of the REI program's agenda is meant to inspire action in the other. Each regional “engine” will approach solutions to pressing social issues in ways that maximize the distinct local competitive advantages of areas across the spectrum of geography and productive capacity.

Because of inherent differences between regions, TIP anticipates very different metrics for success. Generally, Dr. Gianchandani hopes to foster self-sustaining clusters of innovation, optimized to focus on regional challenges, that all contribute to the overall national well being. Ultimately, TIP seeks to replicate the successes of the extremely localized technology and innovation hubs on the coasts throughout the country, through a multi-sector coalition of regional partners.

Focus on Diversity, Equity, Inclusivity, and Accessibility—the TIP “Road Shows”

The NSF has made a concerted effort to develop talent at all levels. TIP has conducted a series of “road shows” that connected the NSF with individuals from every kind of academic institution in an attempt to better understand the barriers to working with the NSF to ultimately widen the talent pool it draws from. Through the road shows, TIP learned more about the challenges to forming strong partnerships, of geographic isolation and to institutional capacity building, as well as the limits of current NSF policies. This specific work led to the concept outline of the NSF Engines program and has given rise to a more inclusive and impact-focused NSF.

Past, Present, Future—Re-Shaping America's Innovation Agenda

Perspectives from National Commissioners

Panel



Mr. Joshua Parker
Chief Executive Officer
Ancora
National Commissioner



Mr. Steven Stevanovich
Chairman & Chief Executive
Officer
SGS Global Holdings
National Commissioner

Moderator



Mr. Bill Bates
Senior Advisor
Council on Competitiveness

Introduction

[*Competing in the Next Economy*](#), released in December 2020, laid out the challenges and opportunities for the United States innovation agenda. It called for a 10x increase in innovation capacity by providing recommendations for strengthening U.S. leadership, elevating the national innovation agenda, increasing R&D investments, closing the digital divide, and deploying a new U.S. technology statecraft. The Council has worked closely with government, private sector, and university leaders to promulgate and implement these recommendations, both within their respective organizations and throughout their fields. At the Mountain West Innovation Summit, the Commission had the chance to take stock of their progress to date and to initiate its second phase.

How the World Has Changed Since 2020

The world of innovation and productivity has changed drastically since 2020. Long-term trends in digitization, telework, and tele-learning have been accelerated tremendously to widespread adoption:

- The workforce is reorganizing and changing. Labor mobility is high and the Great Attrition during the pandemic has caused negotiation weight to fall in favor of workers.



Mr. Bill Bates, Senior Advisor, Council on Competitiveness; Mr. Joshua Parker, Chief Executive Officer, Ancora, and National Commissioner; and Mr. Steven Stevanovich, Chairman & Chief Executive Officer, SGS Global Holdings, and National Commissioner.

- Populations are incrementally moving from urban centers to rural areas and suburbs because of the flexibility granted by telework and cheaper living conditions.
- Since 2020, U.S. business formation has greatly expanded.

The pandemic, however, has also revealed the fragility of U.S. supply chains.

In light of the quickly changing market conditions and these new trends, the Commission's agenda will be focused on four key areas going forward:

1. The transition to clean energy;
2. Accelerating the development and deployment of critical technologies;
3. The future of work; and
4. The future of place-based innovation.

The Commission's Impact in Washington, D.C.

Citing Dr. Gianchandani's efforts to foster place-based innovation through TIP, Mr. Joshua Parker, Chief Executive Officer, Ancora, and National Commissioner, remarked about Congress' positive

reception of *Competing in the Next Economy*: Sens. Joe Manchin (WV) and Chuck Schumer (NY) have returned to the negotiation table to begin to address issues around energy¹; and Sen. Todd Young (IN) cosponsored the United States Innovation and Competition Act of 2021, with backing from legislators across the political spectrum. The strong bipartisan support for the Commission's innovation agenda indicates an understanding of the importance of its goals, especially considering Congress' hyperpolarized environment.

New University Models for Commercializing Innovation and Research

Universities have made strides to become greater contributors to the innovation ecosystem. Traditionally, they have struggled to commercialize faculty research. Many patents awarded to researchers collect dust upon their approval, and schools have generally failed to implement the infrastructure necessary to scale up.

¹ Since the Summit in Wyoming took place, a consensus has been reached between Sens. Manchin and Schumer, and the Clean Energy Bill was passed in the Senate on August 7, 2022.

Mr. Steven Stevanovich, Chairman & Chief Executive Officer, SGS Global Holdings, and National Commissioner, praised the University of Chicago for getting to the root of its lack of commercialization and subsequently creating a model for other institutions to follow. After its U-Tech program to sell patents to venture capital firms failed, the university created the Polsky Center for Entrepreneurship and Innovation, an accelerator that has since launched hundreds of companies. Replicating this success throughout the country in partnership with the federal government will exponentially increase growth and productivity as universities and the organizations within them partner with the government to facilitate real advances in technology and innovation. For too long, universities have been underutilized in the innovation ecosystem. As more become increasingly adept at commercialization, the panel agreed, cooperation and collaboration between academia, industry, and government is crucial.

University-Government-Laboratory Partnerships

The partnership between universities, the federal government, and national laboratories is a new convention in the grand scheme of the United States' history. This symbiotic relationship is a driver of innovation that policymakers have failed to refine and optimize for industry applications. It is an underutilized resource that gives the nation's brightest minds the backing necessary to create revolutionary products and conduct groundbreaking research. Congress has the opportunity to fully commit to this partnership as it allocates the national budget.

Although TIP is a good first step, extracting the full value of universities in the innovation ecosystem will require a unified, collaborative effort from Washington, D.C. Mr. Parker urged the National Commissioners to remind legislators to continue to invest in university-laboratory-government partnerships, while also finding new ways to iterate positive outcomes at scale.

“There’s no better system for driving innovation than the partnership between the federal government, universities, and national labs.”

Mr. Joshua Parker

Chief Executive Officer, Ancora
National Commissioner

From a venture capital perspective, Mr. Stevanovich pressed for more federal help to bring products to market and less red tape separating firms from collaboration with national labs. Too many viable products fail to reach consumers because companies cannot muster the resources or facilities for mass production.

The Role of Private Capital in Innovation

Considering the emphasis on cultivating the university, government, and national laboratory relationships, there are a multitude of opportunities to leverage private capital to accelerate and augment the process of innovation. With the government considering massive spending (USICA, hydrogen hubs, etc.) in the face of historic inflation levels, the panel warned against unilateral federal decisions to fund specific companies. The process of taking a product from development to commercialization is arduous and complex. Private capital firms have the resources and experience to step in and help to commercialize. Funneling money into R&D must be supplemented with the expertise of business specialists provided by venture capital and investment firms to consistently realize gains.

“Maybe the head of the company is a brilliant inventor and knows his science, but bringing something to market is a whole different skillset. This is where venture capital can come in and help companies commercialize.”

Mr. Steven Stevanovich

Chairman & Chief Executive Officer, SGS Global Holdings
National Commissioner

Government-led programs are constantly evolving and expanding. To fully back university, laboratory, and government R&D, the mechanisms that connect private capital with the public sector must be predictable. Firms need to know which projects are available, how they work, how their money will be spent, and what constitutes a successful outcome. Any federal, state, or local program that is being considered must display predictability for the private sector to understand how to properly interface.

Policies to Incentivize Investments from the Private Sector

Rather than attempting to pick a winner in a disruptive industry and attract investment through awards to firms, legislators can use policy measures to incentivize private sector investment, such as through tax credits to induce investment in certain industries or technologies. Tax credits give benefits to companies who can show their portfolios meet certain investment criteria. Renewable energy tax credits, for example, have provided up to 30 percent credit for qualified expenditures. Rather than investing in individual companies based on potential, the government should invest in infrastructure and programs that support innovation activity across the spectrum of emerging technologies.

How Changes in the Workforce Affect Regional Innovation and Development

The unprecedented mobility afforded by the rise of telework has presented communities with a new set of challenges and opportunities. To attract new talent and convince existing talent to stay, communities must make investments to improve quality of life. The workforce's newfound flexibility will increase competition between cities and municipalities vying to bring in more talent. Additionally, programs that encourage students to engage with entrepreneurship, STEM, and research concepts can funnel talent into local universities and businesses.

Telework can potentially improve national innovation capacity by engaging with talent in geographically isolated areas and by diversifying approaches to problem-solving. Workers in different regions bring distinct knowledge to the table that might otherwise go unnoticed. Bringing new historical perspectives into the mix will widen the scope of solutions represented in the science and technology space. The dispersion of talent has also given new life to secondary and tertiary markets. Telework allows venture capital firms to monitor startups from anywhere across the country. This somewhat novel development will only continue to distribute capital geographically throughout all parts of the country. It is up to leaders of industry and government to build up the framework to support development and manufacturing in remote or unorthodox areas.

Growing Physical Infrastructures for Regional Growth

As some regions experience an influx of workers, communities need to address construction capacity. The United States lacks the infrastructure and talent to sustainably scale up its communities. Local and state governments can begin to address this issue by strengthening participation in skilled trades. Trade labor is often left out of conversations on national competitiveness, despite its indispensable role in determining the actual implementation of investments in critical and basic infrastructure. Similarly,

part of the benefit to partnerships with national laboratories is access to core facilities. Building on the existing national laboratory infrastructure is a necessary step to support new talent and innovation.

The Importance of Small Businesses and Start-Ups

The panel noted that the Council must focus on policy proposals to lower barriers to entry for small businesses. Small and medium-sized businesses often miss out on federally funded programs and resources because of red tape and a lack of accessibility.

Valuations for startups in the traditional entrepreneurial hubs have become unsustainable. As it becomes increasingly expensive and risky to fund companies with saturated valuations, venture capital will begin to look elsewhere. Outlandish valuations, paired with the rise of telework, have created ideal conditions to pursue place-based innovation activity. Investing in undervalued startups in isolated regions affords venture capital firms the assurance that their money will stretch further, with less expectations attached.

To uplift regions of the country that have been left behind by the last technology boom, it is imperative to create a “front door” to research institutions through which all businesses can benefit. The NSF Engines program is an example of the government’s concerted effort to partner with businesses and universities at all levels.

Mr. Parker recounted Ancora’s investment in flexible laboratory spaces, which lowered the barriers to entry for small businesses by providing rentable laboratory spaces to conduct research. Investing in the provision of core infrastructure is one route the government can take to encourage more active innovation in the general population. If these companies fail, it should result from natural market forces rather than a lack of resources. Encouraging entrepreneurs to accept failure as a natural part of the ideation process will only increase the flow of new technologies and concepts.

SUMMIT KEYNOTE

Energy Transformation Requires Creative Problem Solving & Leveraging the Extraction Industries for Social Benefit



The Hon. Mark Gordon
Governor of Wyoming

Wyoming's history shows the importance of infrastructure and entrepreneurial mindset for regional development.

Before it became famous for its cowboy culture, Governor Gordon noted Wyoming was first home to industrious pioneers seeking to connect to the coasts using the Transcontinental Railroad. Their work played an indispensable role in bringing industry to Wyoming. This entrepreneurial mindset laid the cultural groundwork for the state of Wyoming that persists to this day, exemplified by the leaders of industry and innovation coming together as a unified front at the Mountain West Innovation Summit.

Wyoming's Role in Finding Sustainable Energy Solutions for the United States

To this point, the simple solutions to climate change, sustainable energy, workforce development, and education have not been sufficient. History, however, can provide perspective on the process of technological development and its implications for solving today's problems. In the 1980s, the development of wind as a renewable energy source was seen as uneconomical and infeasible. The cost-inefficiency of wind power at the time hindered its credibility as a viable energy source. Over time, the technol-

ogy began to catch up to the needs of consumers. Today, Governor Gordon believes the next problem is acquiring a constant source of dependable energy that can fill in the intermittency of renewables. Wyoming, with its vast windswept plains and focused development of nuclear energy, is inextricably linked to energy development in the United States.

Governor Gordon highlighted Wyoming's research of carbon capture, cleaner coal technology, and geologic sequestration as its cutting-edge approaches to solving energy pollution. The state's research university, extensive geography, and history of innovative thinking position it as a prime candidate for future sustainability efforts. Wyoming's university and community colleges give the state the ability to pivot across the board in education, with an emphasis on identifying disruptive technology. Secondary education, in his view, is a means to the end of solving today's and tomorrow's problems.

The Role of Environmental, Social and Governance (ESG) to Evaluate Sustainability

Governor Gordon recognized the crucial role of ESG investing in crafting a future that is beneficial for humanity and the environment alike. When ESG investing first gained traction, the idea was simple: Do not burn coal and use renewable energy. Now, more complex issues have arisen. For example, how do we reckon with the fact that wind turbines take

“In Wyoming, we understand that the solutions to our climate and energy challenges are not mutually exclusive. We just need imagination and ingenuity to honestly solve for both at the same time.”

up large areas of land? Today's problems require creative thinking and innovation that can only be catalyzed by smart ESG investing.

Creative Problem Solving Through Cooperation

Governor Gordon offered up the successful cooperation of American and European farmers to slow the environmental effects of cow overgrazing as an example of the creative problem solving required for today's problems. American farmers reduced the number of cows allowed to graze, while European farmers reduced the amount of time cows spent grazing. Both are two-dimensional approaches to a complex issue. Soon after, research on plant physiology and shared knowledge between both groups of farmers allowed them to optimize their behavior ecologically. Through innovative thinking and cooperation, farmers began to mitigate a looming environmental pressure.

Governor Gordon believes the same can be done elsewhere. Investing in people that share a sustainable vision for future generations is an important step to make a real impact on everyone's material conditions at the present and in the future.

Wealth Generation from Minerals Extraction Should be Used to Benefit Society at Large

Governor Gordon pointed to the wealth generated from minerals as an untapped resource for societal improvement. The oil industry specifically has produced unimaginable levels of wealth, none of which are used to benefit society at large. Governor Gordon noted that the responsibility is now to utilize this wealth in a way that is transformational for everyone, not just those at the highest levels of the mineral development industry. He notes that efforts to utilize this incredible wealth to create a new way forward must be done without demonizing some and canonizing others. It should be done solely to create a better future for the next several generations. Remedying this relationship is the next step in creating better jobs, a better standard of living, better healthcare, cleaner resources, and a better place to raise the next generation.

SUMMIT KEYNOTE

The Innovation Algorithm



Mr. Tony Aquila
Chairman & CEO
Canoo

Innovation and “Negative Violence”

Mr. Aquila reflected that the greatest periods of innovation and technological growth have occurred under conditions of “negative violence.” Wars, pandemics, and natural disasters, unfortunately, tend to induce cooperation between industry, academia, and government, which leads to breakthroughs in science and technology. Without pressure from exigent forces, he argued, complacency sets in. When organizations feel no pressing need to constantly innovate, those who think differently get lost in the shuffle.

Mr. Aquila described the population as divided into three segments based on their approaches to work: Those who “Do it right” (80 percent), “Do it better” (18 percent), and “Do it different” (2 percent). Plateauing product innovation occurs when companies fail to empower those who do it different and those who do it better. In periods of complacency, the “Do it right” segment swallows up the other two, stifling new ideas and ways of doing things.

The “Do it right” group can carry out tasks well and are necessary to build and scale businesses. They lack, however, the creativity and risk aversion necessary to innovate. In the automotive industry, Mr. Aquila believes the 80 percent have become the 98 percent. His company, Canoo Inc., emphasizes the distinctions between the three sectors of workers and actively seeks to play to their unique strengths and encourages them to think outside the box. How does this play out at a company?

The New Trend: Minimalism with Maximum Functionality

Mr. Aquila notes the basic structure of the automobile chassis has only incrementally improved over the last several decades. Real revolutionary innovations occur when creators are willing to unlearn their pre-conceived notions of how things work. Before beginning his venture into the auto industry, Mr. Aquila questioned why chassis with thousands of parts inevitably waste away in junkyards. The answer lay in the systemic failure to empower those who do it different. Since Henry Ford's mass distribution of the automobile, chassis have been constructed around the steering column. All aspects of the basic structure relied on the steering wheel. Because car manufacturers have only made small, incremental innovations on the original technology, the inefficiency of chassis construction was understood to be a sunk cost and a constant that must be built around.

The team at Canoo recognized the inefficiency and waste that promulgated the auto manufacturing industry. They worked tirelessly to completely reimagine how cars are built. Ultimately, they unlearned the central role of the steering column and implemented the first true steer-by-wire technology that can be replaced and installed between chassis. By discarding the traditional steering column, they were able to redistribute weight and then build a platform for replaceable "top hat" car exteriors that can evolve as the owners grow and tastes change.

Democratization

Mr. Aquila views the Canoo chassis as a sustainable long-term investment because of its democratized, customizable interface. It lasts longer than traditional chassis, gets better gas mileage, and only consists of 58 parts that are all made in the United States. The adaptable outer shell diminishes the need to buy more cars to meet new needs. Instead, consumers can simply replace the exterior with a new top hat, which cuts down on wasted parts.

Canoo vehicles also have customizable infotainment. Selling consumers a product that can change to specific individual preferences gives them newfound autonomy. With this freedom through democratization, consumers reduce unnecessary purchases that ultimately reduce valuable resources to junkyard waste.

Leveraging Cognitive Technology for More Sustainability

Even vehicle upkeep has been democratized. Canoo can conduct system updates, upgrades, repairs, and checks from anywhere using computing that will only grow more advanced as quantum and AI become widely adopted. Cognitive technology like AI, that learns solutions exponentially as it operates, provides remote repair capabilities that have never existed. More than 80 percent of all vehicle services will be done over the air using cognitive technology. Using drive-by-wire steering and advanced computing, multiple Canoo vehicles can link into platoons to carry out work with heavy loads. These vehicles can also

be remotely steered using drones and will be able to interface with emerging technologies that have yet to reach wider markets.

The engines that propel Canoo vehicles also break from convention. They are smaller and lighter than traditional engines and utilize propulsion for power. With smaller engines and fewer parts, Canoo has created a supply chain advantage. They rely on fewer microchips and a proprietary IOS system that gives production power back to the United States.

By democratizing all aspects of their vehicles, Canoo is making an affordable, multi-life platform for everyone, manufactured in the American heartland. With sustainability at the forefront of their strategy, Mr. Aquila and Canoo are finding ways to innovate while also creating competitive advantages that reduce waste and allow for a cleaner, more efficient future.

Leveraging American Strengths for Innovation

Canoo headquarters are situated between two states and sovereign native nations. This was done deliberately. Inter-state competition has stifled American growth. Rather than working collaboratively to increase national health and prosperity, states have become increasingly isolated in the pursuit of state-level growth. In creating headquarters between two states and sovereign native territories, Canoo sought to promote cooperation between states. Within the national innovation ecosystem, the participation of native Americans is a rarity. Mr. Aquila and Canoo have also made a special effort to work with native Americans on their sovereign lands. The government has failed to capitalize on this hidden national strength. By operating on sovereign territory, Canoo brings jobs to underdeveloped regions and brings manufacturing home. To uplift United States competitiveness, every advantage and avenue to growth must be explored. The idea to bring native Americans into the manufacturing process was only conceived by unlearning traditional methods for upscaling.

The Key is Getting the Algorithm Right—M.E.T. (Mindset, Equipment, Training)

The most important aspects of a successful innovative venture, according to Mr. Aquila come down to three things: Mindset, equipment, and training. The algorithm for innovation is complex and multifaceted. Canoo, however, developed the M.E.T. model to cultivate the culture that has defined their work.

- **Mindset.** First, companies must encourage active ideation at all levels of research and production. To innovate, factions of conventional thinkers cannot influence what companies choose to pursue. If companies become hindered by preconceived notions of past concepts, they will fail or, at the least, plateau into irrelevance. They have to be willing to take unorthodox approaches to longstanding problems if they truly want to create new solutions. While there is always a place for the “do it right” and “do it better” thinkers down the line of production, disruptive companies must take steps to recruit talent that feeds into a culture of creativity.
- **Equipment.** Organic and inorganic equipment make up the building blocks of Canoo. Organic equipment represents the socialization and life skills that employees bring to the table. Inorganic equipment, on the other hand, are the tools and skills gained from education. Attracting workers with unusual combinations of organic and inorganic equipment is a means to diversify perspectives and draw out more from the workforce.
- **Training.** Most companies spend massive amounts of time and money to train their workforce, and this is something Canoo has taken to the next level. Mr. Aquila views training as a method to face weaknesses before they affect the company’s product. As a result, Canoo emphasizes training that fully integrates new employees into the creative process. It joins them into the greater body of the company and prepares them to carry out their work in concurrence with Canoo’s vision in mind.

“The biggest thing revolutionary thinkers do is to democratize. They look at things and ask, ‘Why can’t everybody have this? Why is it just the privileged? Why isn’t it faster? Why isn’t it different?’ They live in a constant state of dissatisfaction.”

The M.E.T. algorithm can be applied bi-directionally. If the company acquires a new group of employees, Mr. Aquila flips the algorithm to T.E.M. First, Canoo tackles training, then assesses employee equipment, and finally discerns each individual’s mindset in order to place them into roles that best suit their abilities. For algorithms to be comprehensive frameworks for success, they have to be simple, and also adaptable.

Creating a Fertile Environment for Innovation

Fostering a creative, persistent culture is the key to innovation. People need to be emboldened to try new things and continue to try when they fail. Universities are critical to push the envelope. Currently, universities are successful at producing the “do it right” and “do it better” thinkers, but more emphasis needs to be placed on rallying the “do it different” group. Professors need to become more receptive to students that want to work outside of the system. Rather than force students to buy into traditional ways of thinking, professors need to be willing to listen, adapt, and bring the two percent into the fold.

SUMMIT KEYNOTE

Building a Regional Innovation Ecosystem

International Cooperation for Research and Science Excellence

Dr. Seidel's wide-ranging experiences in the development of innovation hubs has shaped his approach to establishing Wyoming as a center of research and entrepreneurship. A decade ago, President Barack Obama and former President of the Russian Federation, Dmitry Medvedev, met in Arlington, Virginia, to discuss American universities' outsized contributions to innovation in comparison to Russian universities. After their meeting and through consultation with Massachusetts Institute of Technology (MIT) (and a \$300 million contract), Medvedev endeavored to create a university and innovation district right outside of Moscow. With MIT as a brain trust, Dr. Seidel worked with the Russian Federation to build a graduate-only institution with interdisciplinary research centers focused on three key themes: research, education, and innovation. Each center featured education programs specializing in market sectors of special importance to the Russian government, such as information technology and biotechnology, among others. Dr. Seidel helped with corporate engagement and entrepreneurship, which ultimately inspired his administration's establishment of the University of Wyoming Center for Entrepreneurship and Innovation. As the political environment in Russia deteriorated, Dr. Seidel took the lessons learned from this exciting project back to the United States.



Dr. Edward Seidel

President, University of Wyoming
[National Commissioner](#)

Dispersing Educated Talent to Rural Areas to Increase Regional Economic Development

Upon his arrival, Dr. Seidel began work as the director of the University of Illinois Urbana-Champaign National Center for Supercomputing Applications and later transitioned to Vice President of Economic Development. In this role, Dr. Seidel and National

Commissioner Dr. Tim Killeen, President, University of Illinois System, sought to create the Illinois Innovation Network (IIN) in Chicago to align all 12 public universities together with national laboratories with the common goal of generating greater research and innovation. Linking together rural and urban economies was especially important to Dr. Seidel. Students from rural areas would gain skills in advanced research and entrepreneurship and then return to rural areas throughout the state, resulting in the dispersion of innovative thinking away from urban centers. Despite a \$50 millions (45 percent) budget cut to the university initially, the IIN eventually received a \$500 million appropriation, thanks to persistence and a great deal of political support.

The Development of the Wyoming Innovation Partnership

With these lessons, Dr. Seidel arrived at the University of Wyoming and met with the Governor of Wyoming to gauge interest in innovation programs, as well as the leaders of the eight Wyoming community colleges to propose a consortium to align all higher education in the state. Together, they developed a white paper with all the community colleges that laid out their common vision for the project. The Governor supported the consortium and soon announced the Wyoming Innovation Partnership (WIP). For over a year, the WIP has met weekly to drive forward the statewide innovation system. Using money from the American Rescue Plan, Governor Gordon provided the WIP with a \$27 million first round investment, along with another \$27 million from the state legislature.

Goals of the Wyoming Innovation Partnership

The WIP seeks to make Wyoming more digitized, more entrepreneurial, more interdisciplinary, and more inclusive. These four pillars have thus far led to the creation of the University of Wyoming School of Computing and Center for Entrepreneurship and Innovation. WIP also focuses on economic drivers

“We are building out collaborations across this region—particularly with the Dakotas, Montana, Idaho, Utah, and Colorado—to figure out how best to organize our innovation ecosystem.”

within the state. It has founded the Wyoming Outdoor Recreation Tourism and Hospitality Initiative, a program at the university that provides students with real experiences working in the state's second largest industry. Innovation and economic growth are at the heart of the WIP, and merging industry with education in this fashion, Dr. Seidel believes the university is preparing students to actively contribute to the state's key sectors.

University of Wyoming Partnerships

Because of Wyoming's isolation from traditional hubs of innovation, partnerships are essential to reach a critical mass. Dr. Seidel has facilitated partnerships with Argonne National Laboratory, Idaho National Laboratory, and even Cardiff University in Wales, which features the Welsh Software Academy. The UK also has a particularly long history in the coal and agriculture industries. Like Wyoming, it is attempting to modernize its education system to position its students for future success. Drawing this parallel, Dr. Seidel has been working to devise two-year and four-year computer science programs at the university and community colleges in Wyoming. This is a statewide effort, and partnerships with the state government, Wyoming Business Council, national laboratories, and global universities, among others, are the key to getting it off the ground.

The Future of Finance

Panel



The Hon. Cynthia Lummis
U.S. Senator, Wyoming



Prof. Steve Lupien
Director, Center for
Blockchain and Digital
Innovation
University of Wyoming



Dr. Ali Nejadmalayeri
John A. Guthrie Endowed
Chair of Banking and
Financial Services
University of Wyoming

Moderator



Mr. Bill Bates
Senior Advisor
Council on Competitiveness

Introduction

The world of finance is being swept-up in a whirlwind of change from reinvention, new technologies, and new business models. The pandemic fueled even more change as businesses and consumers in lockdowns migrated to contactless and online shopping that rely on digital finance systems. Fintech firms have opened a revolution in finance and are challenging big banks and blurring industry lines with new providers, new platforms, and new products; big data has joined money as the finance industry's lifeblood; AI and machine learning are coming hard

and fast, while quantum and cognitive computing are waiting in the wings; and decentralized and direct-to-consumer finance, on demand financing, point-of-sale credit, and capital as a service are expanding.

Even the federal government is assuming the role of big investor, ready to invest tens of billions of dollars to stimulate new U.S. high-tech manufacturing capacity. Regulators around the world are trying to get a handle on these rapid, game-changing developments.

Video Message from Wyoming Senator Cynthia Lummis

Although the United States is the global leader in finance, new developments in digital assets require special attention from legislators. The digitization of finance has ushered in a new era characterized by speed and efficiency. Sen. Cynthia Lummis (WY) and Sen. Kirsten Gillibrand (NY) have begun to create a framework for digital asset innovation. In developing this legislation, Sen. Lummis wants to keep two goals at the forefront: (1) clarity to both industry and regulators, (2) guidance through legislation in cyber security. Ultimately, this legislation is meant to drive innovation while also protecting consumers.

Web. 3.0 and Its implications

In the 1990s, Web 1.0 primarily provided information to users. Key functions, like peer-to-peer transactions, were not yet possible. With the creation of Web 2.0, transactions have become the lifeblood of the shared internet experience. Purchases are driven by intermediaries in this system (banks) that connect consumers with digital vendors. This has facilitated the digitization of physical commodities unlike any other time in human history. Web 3.0 will do away with the intermediaries. It will allow for the movement of value over the internet, creating a system of peer-to-peer finance for the first time. Web 3.0 will impact the financial services sector in a number of ways.

- First, the use of digital currency will continue to grow and change. Consequently, payment systems will change as consumers rely more on digital currency.
- Platforms for trading “stable coins” will become increasingly important to the financial environment.
- Inevitably, government will become more involved in regulatory measures, which has necessitated a discussion about the creation of a central banking system for digital currencies.

“We have to think and drive innovation in a way that is positive.”

Prof. Steve Lupien

Director, Center for Blockchain and Digital Innovation
University of Wyoming

- The Metaverse will change entertainment and education. In its ecospheres, digital currency will serve as the store of value for all transactions.
- Lastly, the decentralized finance (DeFi) market is a newly emerging way to interact with banking and within the digital asset space that will decentralize and democratize finance.

A New Strategy for Web 3.0 Is Needed

With a bevy of both positive and negative implications for the future of finance, it is crucial to begin crafting a strategy to deploy Web 3.0 for the benefit of the greater population.

The federal government has failed to adequately prepare for the incoming digital revolution. Because of the lack of regulations surrounding digital assets, bad actors have been able to thrive by offering digital products with no assurance of real value. Crypto lenders operating in an unregulated environment is unsustainable, and legislators need to take notice.

Wyoming’s Efforts in the Digital Asset Space

Since 2016, Wyoming has passed 30 bills enabling digital assets. The state has pioneered the transition to widespread digital asset adoption and hopes to leverage its early efforts into becoming the national digital asset hub. It is the first state to codify the

“We, (as financiers of our own destinies), stand in front of a future (of new opportunities), look through that future, and then try to figure out how we can bring that future to fruition.”

Dr. Ali Nejadmayeri

John A. Guthrie Endowed Chair of Banking and Financial Services
University of Wyoming

definition of digital assets, which is now becoming federalized with the H.R. 1628 bill. Creating a legal definition for digital assets eases some of the uncertainty for businesses that want to invest in or collaborate with actors in the space. Most importantly, Wyoming has created the first new financial services industry in the United States in the last 50 years, called Special Purpose Depository Institutions. These are reserve banks that are allowed custody over digital assets. Why is this significant? Under U.S. law, certain investors need third party custodians to invest in certain categories. Without qualified custodians, it is impossible to bring investment to those specific asset classes. It provides a regulated framework and entity to encourage in-state investment in digital assets.

Potential Future of Finance

Technology has made significant changes to the finance system and will continue to shape the future of finance.

- Blockchain has revolutionized payments, back-office operations, and provides users with security as well as access.
- Because digital assets are intangible, banks have no real incentive to invest. There needs to be collateral. Venture capital firms have experimented in the funding of intangible assets, but successfully integrating digital assets into the financial system will require taking the VC model to a larger scale.
- The amount of data involved in these processes has grown significantly—so much so that we have begun storing it in the Cloud. To transact all this data, we need to solidify a conduit that can finance data exchanges.
- Sustainability is the greatest challenge of modern times. Renewable energy, smart connectivity, and urban planning affect corporate funding, municipal funding, and city funding. With energy transition on the horizon, leaders in finance need to design a new type of financing and contracts to account for sustainability challenges.

“The pandemic was a rude awakening to the U.S. as to how sensitive and non-resilient our supply chains are, and that this is something that needs to be addressed immediately. “

Mr. Bill Bates

Senior Advisor

Council on Competitiveness

- As demonstrated by the quick response to the COVID-19 pandemic, innovations in biotech are critical to public and economic health. How should this be paid for? How are rights defined? How will new predictive insights impact the insurance industry? These are burning questions that leaders in finance and biotech alike need to answer.
- The aging global population will strain the financial sector. What systems can be enacted to help elder citizens maintain financial security after retirement?

The old models for designing financial contracts are obsolete. Now, alternative data present the greatest opportunity to conduct due diligence when considering entering a contract with another party. The internet holds data on all of its users, but only some of it can give investors a window into the character of a potential partner. As Web 3.0 begins, new ways to assess financial partnerships, mitigate risk, and increase trust, must be considered.

China's Early Efforts

China has moved its entire economy online. All Yuan transactions between residents exist in a centralized, state controlled virtual entity, which gives the government access to every transaction. This allows for mass surveillance that can be utilized to attack political opponents and even wipe out wealth for individuals. As the United States moves its economy to the internet, legislators need to implement guardrails that limit government access to financial data and allow for the flow of digital assets between residents.

The Future of Energy

Panel



The Hon. David Freudenthal
Former Governor, Wyoming



Ms. Sharon Fain
Vice President Rocky Mountain Power

Moderator



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

Introduction

The world is facing an energy crisis. The Russian invasion of Ukraine has roiled energy markets and driven price spikes that are sparking inflation around the world. In the long-term, energy demand is expected to soar nearly 50 percent by 2050, due to population and economic growth, and industrialization in the developing world.

Energy is the lifeblood of the economy, and its cost and use are inextricably linked to competitiveness. But energy is also inextricably linked to climate change, and there is a dire need to curtail the carbon emissions generated by fossil energy production and consumption.

To meet the challenge of sustainable energy, countries around the world have begun a major energy transition, that will not only transform the kind of energy used, but also transform human activity, human habitats, and the products humans use in their everyday lives and how those products are produced.

The clean energy and sustainability sector is also a grand opportunity for innovation and economic development. Many companies have committed to curbing emissions, decarbonization, and even reaching net zero. And there is growing potential for technology solutions from carbon capture and storage to artificial photosynthesis to create fuels such as hydrogen from sunlight.

The Energy Transformation

As the world moves toward more sustainable energy sources, utilities companies have an obligation to support the communities that will be impacted by the energy transition. Rocky Mountain Power is currently reimbursing employees that choose to pursue a college degree or certification. They are working with communities to secure economic development administration matching funds to undertake economic diversification studies and implementation. Rocky Mountain Power has done business in Wyoming for more than a hundred years, and as a result, it feels a commitment to empower the communities that will lose key industries as a result of the energy transition.

The energy transition will occur slower than advocates want, and faster than opponents want. Wind energy output will double in the next five years, and coal production has nearly halved since the aughts. The political environment is unpredictable and highly correlated with the speed of the energy transition. Because of this uncertainty, the private sector has become the greatest indicator of the speed of the transition. Recently, the private sector has moved to advertising green, sustainable solutions. This hints that the private sector believes the energy transition will be powered by the consumer and is inevitable. The government needs to facilitate the transition in a way that minimizes impact to communities that rely on traditional energy sources for economic health.

“We need a rational discussion about energy policy. It needs to be long-term, it has to be well-funded, and we have to understand that not all of it is going to work.”

The Hon. David Freudenthal
Former Governor, Wyoming

High turnover rates in government have introduced a number of climate policies that are not consistent across the board. Very few projects aimed at mitigating climate change are sustainable long term, and as a result, the energy transition may be an inefficient process because of the ebb and flow of political power.

Changes in Government Policies

The process of collecting the necessary permits to construct energy infrastructure can take years, even decades. It slows the growth of energy development in the United States and hampers the ability to compete in this emerging market. Legislators must focus on ways to streamline this process and actively encourage companies to expand their production capacities.

“We are committed to supporting the communities and the workforce impacted by the energy transition.”

Ms. Sharon Fain

Vice President

Rocky Mountain Power

A painless energy transition requires sustained investment from the government and the private sector alike. Tax credits have incentivized vast improvements in clean energy technology, but legislators need to implement programs that will span multiple administrations. Without sustained commitment, political disarray will lead to the breakdown of government efforts.

Since the mid-20th century, Americans have become accustomed to paying inordinately low prices for energy and food. Subsidies to agriculture have powered the market for food, but as the energy transition commences, leaders must prepare consumers for price spikes. If consumers face unexpected price hikes that tangibly effect their lives, support will falter. To prepare the citizenry for this momentous shift, leaders of industry and government must take an active approach in educating the public.

Easing the Energy Transition

Pacific Power’s project in Kemmerer, Wyoming, to repurpose an existing coal plant exemplifies the private sector’s ability to ease the energy transition on rural communities. As plants in the area face closure, Pacific Power, in collaboration with the local Terra-Power plant, will utilize the existing infrastructure to support nuclear energy development. Pacific Power will work with the workforce to re-skill, relocate, and match workers with roles that fit their skillsets.

The Pacific Power project highlights the scale needed to ease the energy transition. The project is expensive and may not live up to its full potential. If government-assisted programs fail, political opposition will pounce at the opportunity to place blame on the other side. The reality is, Americans expect the government to succeed 100 percent of the time. In the private sector, there is an innate understanding of risk. The public needs to understand that some investments will fail, and when they do, legislators cannot immediately walk back their commitments. Ultimately, the energy transition needs to be sustained, well-funded, with the expectation that some projects will succeed and others will fail.

The Future of Place-Based Innovation

Introduction

To meet challenges to U.S. technology leadership, boost U.S. competitiveness, solve global problems, and expand prosperity across the country, the Commission challenged the nation to increase the U.S. rate of innovation 10x. To achieve this goal, the United States must increase the number of people and places that are part of its innovation ecosystem.

But many communities without research institutions are not part of this system now, or part of a thriving high-tech, knowledge-intensive cluster or economy. The pandemic induced the scaling of telework, enabling talent to move out to new places with the potential to inject new creativity, innovation, and entrepreneurial potential in many regions of the country. As the COVID-19 pandemic continues, many states, cities, regions, and communities are recalibrating—reframing their strategies, and considering new policies and programs.

Arizona and Wyoming face different environments and regional ecosystems, but their core challenges are remarkably similar: regional brain drain and talent retention are critical challenges for both.

ASU's Current Efforts

Arizona State University (ASU) and the state of Arizona have become a hotbed for innovation and industry. ASU has ranked as the most innovative college by *U.S. News & World Report* for the past seven years. The state of Arizona has also attracted

Panel



Dr. Sally Morton

Executive Vice President,
Knowledge Enterprise,
Arizona State University



Dr. Dan McCoy

Director
Wyoming Outreach,
Recreation, Tourism and
Hospitality Initiative

Moderator



The Hon. Deborah L. Wince-Smith

President & CEO
Council on Competitiveness
[National Commission](#)
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companies on the cutting edge of emerging technology development, like Intel. ASU is driven by its commitment to inclusivity. Graduation rates have increased, the number of first-generation and Pell-eligible students has risen, and ASU was just designated as a “Hispanic serving institution.” ASU also draws on trans-disciplinary schools and colleges to comprehensively analyze the conditions faced by the community and society at large.

ASU has established seven “Innovation Zones” throughout the state that allow students to connect with businesses statewide to gain hands-on experience. They customize each innovation zone in partnership with the local communities. This collaborative model for the creation of innovation hubs comprehensively accounts for local features that might go unnoticed otherwise. ASU also has charter schools throughout Arizona that provide K-12 education and sponsor certificate programs to support lifelong learning.

Future of ASU

In the near future, ASU will open its eighth innovation zone. Additionally, partnerships are a key component of their place-based innovation strategy. While place-based innovation inherently involves geographic proximity, partnerships are the key to building up communities. Borrowing strength from organizations and institutions across the country and re-implementing shared knowledge within the community provides ASU with new perspectives and approaches.

While TIP will support research in emerging markets, Dr. Sally Morton, Executive Vice President, Knowledge Enterprise, Arizona State University, expressed concern about the uncertainty of long-term funding for the program, especially in a hyper-polarized political environment. Scaling up research facilities and connecting organizations over an extended period of time will prove challenging.

“Our biggest challenge is people; retention and recruitment across the university.”

Dr. Sally Morton

Executive Vice President, Knowledge Enterprise
Arizona State University

Dr. Morton noted that sustainability of education is a key focus of her work at ASU. Specifically, developing programs that provide opportunities for lifelong learning as a means to give workers the skills to adapt to the ever-changing labor market.

ASU's Talent Retention Challenge

Even though ASU has received substantial investments from the state through the New Economy Initiative, ASU's greatest challenge to innovative growth is talent retention. While Dr. Morton is incredibly grateful for the support, the university cannot hire faculty fast enough to keep up with the influx of investments. They are losing key faculty to the private sector, enticed by greater pay and the opportunity for remote work. Talent is the currency of innovation, and the shortage of talent willing to work with the university has encumbered its goals to expand innovative capacity.

Future of Place-Based Innovation in Wyoming

Along with faculty at the University of Wyoming, Dr. Dan McCoy, Director, Wyoming Outreach, Recreation, Tourism and Hospitality Initiative, helped get the Wyoming Outdoor Recreation Tourism and Hospitality (WORTH) initiative off the ground. WORTH seeks to expand and diversify the economy through outdoor recreation and hospitality through three main channels: Launching educational products to serve the workforce, outreach and extension, and applied research throughout the state.

“Investing in quality of life will pay significant dividends to communities by making them places where people want to move, fostering and driving innovation.”

Dr. Dan McCoy

Director, Wyoming Outreach, Recreation, Tourism and Hospitality Initiative

Half of Wyoming's geography consists of public land. Iconic national parks, the first national forest, state lands and state parks are all tremendous assets to the state. Consequently, the tourism and hospitality industries have evolved into Wyoming's largest employer. It is the second largest economic driver in the state, generating \$4.2 billion in direct spending in 2021. Outdoor recreation accounts for 3.4 percent of GDP, among the highest of any state in the country.

Wyoming's Biggest Challenge: Regional Brain Drain

But Wyoming is facing a brain drain. As mentioned by Dr. Seidel, 70 percent of graduates leave the state. Six percent of millennials and 11 percent of wage earners have also departed since 2008. Additionally, remote work may not be the boom for Wyoming's place-based innovation system that many hope for. Every person that moves to Wyoming while working remotely in another state costs Wyoming around \$23,000 in lost income tax revenue.

To begin tackling the talent migration, Wyoming must address its structural issues and improve quality of life to the extent that residents want to stay and raise families. To the latter, increased investment in outdoor recreation, like trails and parks, will utilize the state's natural strengths to attract families.

Capitalizing on every competitive opportunity, with emphasis on the state's strengths in tourism and energy development, will work to shift public opinion for the better.

Tourism is not the panacea to Wyoming's brain drain. Jackson Hole, for example, has experienced the crushing effects of over-tourism. In addition to the negative, local public perception of increased tourism, environmental considerations must be addressed. To do so, the local government is working on developing a sustainable tourism management plan that will funnel tourism to places that will benefit. Moving away from pure marketing for tourism, leaders need to take a managerial approach to strategically promote certain areas within the state. Mechanisms must be put in place to finance these projects and temper down uncertainty within government and the private sector, and with the public.

Similarly, the hospitality sector has been devastated by a shortage of employees. Standards for service are becoming increasingly difficult to meet as the lack of workers has strained the hospitality workforce. Mitigating this decline is crucial to maintaining Wyoming's key industry.

The Future of Partnerships between Industry, Academia, the National Laboratories, and Critical Stakeholders

Panel



Dr. Parag Chitnis

Vice President for Research and Economic Development
University of Wyoming



Dr. Marianne Walck

Deputy Laboratory Director for Science and Technology and Chief Research Officer
Idaho National Laboratory

Moderator



Dr. Edward Seidel

President
University of Wyoming
[National Commissioner](#)

Introduction

Universities, national laboratories, and industry each play major roles in the innovation ecosystem. Universities perform about \$80 billion annually in R&D—a majority of national basic research—while educating the next generation of innovators and entrepreneurs. Industry converts knowledge and research into economic benefit. Coupling with academia to commercialize research is a key function within the innovation ecosystem. National laboratories are incredible engines for knowledge generation and application at a scale that universities do not have. The 17 national laboratories of the DOE are a significant competitive advantage for global leadership in technology and innovation.

National Laboratory Perspective on Partnerships

Currently, there are three DOE “earthshot” projects focusing on single technology issues that will require strong partnerships locally and with industry over a ten-year time horizon: Hydrogen, energy storage, and carbon negative. These projects require collaborating with the federal government to ease the permitting process, communicating with universities to convey proposed opportunities, and constructing agreements with industry.

National laboratories must seek different kinds of partnerships. First, they must garner broad support across the government. Congress decides how funds are allocated, so laboratories must establish clear lines of communication to indicate what they need.

Second, they need partnerships with agencies across the federal government to couple R&D results with demonstrations funded by Congressional allocations. National laboratories need a greater level of collaboration. Too often, they compete amongst themselves and fail to cooperate in a manner that would increase productivity. Past instances of inter-laboratory partnerships have highlighted a way forward, however. During the height of the COVID-19 pandemic, the DOE established the Virtual National Biotech Lab, which connected teams of leaders in academia and industry to create products focused on testing. Academia is an integral partner to the success of national labs. They provide key basic research that is coupled with national laboratory research and eventually commercialized by industry.

Finally, national laboratories must include communities in their partnerships. Any discussion of mineral or energy development ultimately impacts local communities. Without the support of communities, much of national laboratory work is not sustainable over long periods of time.

Academia's Perspective on Partnerships

Partnerships with national laboratories drive forward university research because of the accessibility of critical infrastructure. Industry ties together the innovation system by taking research to market, bringing real benefits to everyday consumers. Industry also provides economic incentive to continually push the envelope of innovation. The NCAR-Wyoming Supercomputing Center, for example, will increase capacity in the coming months. To capitalize on the increased capacity, the University of Wyoming will work closely with INL on projects in workforce development and research.

“In order to elevate the research done at labs and universities, we need to create partnerships that are conducive to collaboration and also benefit regional innovation economies.”

Dr. Marianne Walck

Deputy Laboratory Director for Science and Technology
and Chief Research Officer, Idaho National Laboratory

Wyoming has vast areas of sparsely populated land. Bringing in these isolated, rural communities into the innovation ecosystem is a multifaceted challenge faced by certain academic institutions. There are often cultural differences that prevent broad statewide efforts from adequately reaching isolated communities. Population density is so low in some areas that some effects of outreach are negligible. To give rural communities an opportunity for participation in the innovation ecosystem, universities must partner with anchor industries or companies to play off local strengths. Small, local businesses can then contribute to the local economy by working in collaboration with these anchors. Universities and community colleges will play a necessary role in facilitating rural growth. By partnering with workforce development officials, academia can shape the workforce to meet the needs of the market. Strong partnerships between academia, national labs, and industry based on mutual interest will create networks of key players in the innovation ecosystem throughout the country.

Examples of Success and Failure

Oftentimes partnerships with national laboratories result in de facto partnerships with industry. All aspects of the partnerships work together in concert, contributing to each other. For example, USDA

“What kind of innovations are needed to support economic development in rural communities?”

Dr. Parag Chitnis

Vice President for Research and Economic Development,
University of Wyoming

wanted to form a partnership with the Research Councils United Kingdom (RCUK), a non-departmental public body which coordinated science policy in the U.K. Through its previous partnerships with the NSF, USDA was easily connected with RCUK.

Many of DOE national labs' programs have built in partnerships. At INL, Dr. Marianne Walck, Deputy Laboratory Director for Science and Technology and Chief Research Officer, Idaho National Laboratory, has partnered with several different reactor development companies on reactor demonstrations. These essential partnerships are based on mutual interest, as INL provides the infrastructure to test technologies that are not ready for market. Energy Frontier Research Centers funded out of the DOE Office of Science require robust partnerships with universities. These centers conduct use-based studies on topics

like nuclear fuels, carbon sequestration, etc., and have greatly accelerated the maturation of research that can be broadly adopted by society. Partnerships cannot be forced, and partnering for the sake of partnering can hinder progress, as unnatural fits between organizations can lead to friction.

How to do a Better Job at Rural Place-Based Innovation

Facilitating centers of innovation in rural areas requires a greater deal of coordination compared to larger markets. Isolated areas need robust networks of organizations, paired with partnerships between sectors to sustain them. Dr. Parag Chitnis, Vice President for Research and Economic Development, University of Wyoming, noted that policymakers need to take steps to discern which programs work and which do not. Continuing to fund programs that have demonstrably failed will only contribute to economic and social isolation of some of these rural areas. On the other hand, rural areas have the benefit of flexibility. Smaller communities do not require massive infrastructure to support innovation activity. Smaller investments go a longer way.

The National Commission on Innovation & Competitiveness Frontiers Enters a New Phase

Since the release of the critical Phase One report of the Commission, [Competing in the Next Economy](#), new challenges have emerged that demand new answers from the National Commission—and the Summit panels and keynotes have addressed many of the complex issues related to these challenges.

The Commission is therefore starting a new, second phase of Working Groups with the launch of four new issue areas:

- The Future of Sustainability: Accelerating Innovation in Clean Energy Technology
- The Future of Technology: Developing and Deploying Disruptive Technologies at Scale
- The Future of Work: Developing, Supporting, and Expanding the Modern Innovation Workforce in an Era of Creative Destruction
- The Future of Place-Based Innovation: Broadening the Innovation Ecosystem

Breakout sessions were held on both days of the Summit to provide participants with plenty of time to discuss the key priorities for the Working Groups, which will be developing a new set of recommendations during the coming months for distribution in 2023.

Working Group Summaries

Working Group 1

The Future of Sustainability: Accelerating Innovation in Clean Energy Technology

Key issues:

- **Need for basic research:** The recent infrastructure bill passed by the Biden-Harris Administration is primarily focused on deployment, while lacking the basic research to meet the needs to transition to the next economy.
- **Scarcity of critical minerals:** The existing minerals and elements for electronic products are not sufficient. New ways to source and produce these resources must be established.
- **Barriers to commercialization for researchers:** Professors lack the proper incentives to promote a swift commercialization of research. There is a need to streamline the process of getting products to market, and there must be better horizon planning to ensure a more efficient process for R&D.

Policy action items:

- To improve policy with respect to sustainability, the group recommended that legislators place the focus on outcomes. Most sustainability policy is geared toward supporting various industries, like wind or solar energy. Clarifying in real terms the intended consequences of policies will level the playing field and reduce the government's role in picking winners and losers.



- The DOE needs to rally around sustainability and clean energy development, as most of its focus is on basic fuels. Reorganizing the DOE to tackle the energy transition is imperative.

Working Group 2

The Future of Technology: Developing and Deploying Disruptive Technologies at Scale

Key issues:

- Like Working Group 1, Working Group 2 noted **inefficiency in the allocation of investments for R&D.**
- Moreover, they **added additional technologies to the existing disruptive technology list:** energy, automation, virtual reality, digital twinning, and supply chain connection, which is inextricably linked to other technologies on the list.
- **A more measured approach to economic and national security leadership is needed.** They believe issues must be addressed from the standpoint of offensive or defensive posturing to ensure United States maintains its global status as an innovation leader. The United States has lost dominance in manufacturing and must carefully craft strategies that benefit national interests. The future of sustainable production and consumption rests largely on the nation's ability to efficiently invest in R&D and maintain gains from productivity.



Top: Breakout Group 1 Co-chairs Mr. Rich Brown, Senior Vice President, Bank of America; and Dr. Holly Krutka, Director, School of Energy Resources, University of Wyoming.

Bottom: Breakout Group 1 Co-chair Dr. Cindy Powell, Chief Technology Officer, Energy and Environment Directorate, Pacific Northwest National Laboratory.

- The energy transition has serious implications for policy at the state level. Wyoming is faced with a lack of housing, inadequate healthcare, and insufficient infrastructure. With plans to attract a new wave of workers to the state, Working Group 1 noted that Wyoming and similar rural states need to assess if they have the resources to support growth and develop plans to address any areas of concern.
- The current regulatory environment impedes research at the scale and speed necessary to pursue innovation that can meet the needs of consumers.

Policy action items:

- **Create a National Innovation Director role.** Envisioned as an analog to the Director of National Intelligence, the National Innovation Director would knit together the innovation activities of the various federal agencies. To augment the proposed director, Working Group 2 advocated for an institutional focus on holding government accountable for investments in innovation by tracking strategy and outcomes. They also emphasized the importance of working with the National Institute of Technology and Standards (NIST) to engage in standards development. The National Innovation Director could then assist in the convergence of national priorities. Operation Warp Speed demonstrated



Top: Breakout 2 Moderator the Hon. Kimberly Reed, Distinguished Fellow, Council on Competitiveness

Center: Breakout 2 Co-chairs Mr. Everette Joseph, Director, NCAR; and Mr. André Doumitt, Director, Innovation Development, The Aerospace Corporation.

Bottom: Breakout 2 Co-chair Dr. Neil Thompson, Director, FutureTech Research Project, MIT Computer Science Artificial Intelligence Lab, and MIT Initiative on the Digital Economy, Massachusetts Institute of Technology.

the speed and efficiency of national innovation capacity when priorities align. Having a unified approach to innovation in a similar capacity could yield similar results.

- **Increase intentional funding of translational research.** Most national laboratory research is basic or applied. By turning to translational research, laboratories can mitigate risk for private investment. This effort would involve deep collaboration from universities, national labs, and industry.
- **Create a national marketplace to power the supply chain.** The proposal would seek to identify gaps in the internal national supply chain and incentivize the entrance of new supply chains into new marketplaces.

Working Group 3

The Future of Work: Developing, Supporting, and Expanding the Modern Innovation Workforce in an Era of Creative Destruction

Key issues:

- **Need to effectively prepare workers with skills that meet the needs of industry.** There needs to be a place for industry representation in higher education. There is a gulf between higher education in the liberal arts and what industry actually needs. Companies waste valuable time and resources training interns, apprentices, and co-op assignees. If universities better prepared students to hit the ground running in their pre-graduation programs, the workforce would benefit greatly.
- **Harnessing telework in a way that maximizes gains.** Firms can utilize telework to provide skills-based training to award badges and certificates to employees that learn new skills digitally. Telework allows firms to draw from a broader pool of human capital, but also leaves behind communities with limited access to broadband. They stressed that there is abundant opportunity to foster place-based innovation as industries move toward a greater reliance on telework.

- **Options for skills translation**, which would transition skilled workers in dying industries into roles in other, conceptually similar jobs. For example, mineral extraction and aerospace engineers have skills that will translate relatively well into one another. As the energy transition progresses, finding new positions for skilled workers will be essential.

Policy action items:

- **Create a culture of learning** to keep up with automation over time with help creation of a federally tax-deductible 529 account for learning that follows employees across jobs and sectors. Through this proposed tax incentive, employees will be encouraged continue to develop their skills throughout their careers. Within this concept, Working Group 3 also discussed industry training resources, and whether training should come from higher education, workforce services, or certification stacking.
- **Immigration policy will also play an important role in shaping the workforce of the future.** Working Group 3 made a special effort to discuss how a lack of diversity can ultimately hold companies back.

Working Group 4

The Future of Place-Based Innovation: Broadening the Innovation Ecosystem

Key issues:

- **Establishing regional and national strategies to define, coordinate, and support specialized innovation hubs.** A broad approach would involve performing diagnostics on each region to determine what unique problems and opportunities each area poses. This would involve grassroots-level scouting to analyze each region's distinct features, which is not feasible from the top down.
- **Mitigating risk, which requires seeking expert help when looking to invest in opportunities.** Failure will happen and risk is inevitable, however, making calculated decisions can lessen negative impacts.



Top: Breakout Group 3 Co-chair Ms. Van Ton-Quinlivan, CEO, Futuro Health.

Center and Bottom: Breakout Group 3.

- **Focusing on industries through tax incentives**, rather than attempting to pick winners, can help provide a level of scope necessary to discern market trends.
- **Branding.** There are inherent differences that distinguish each region of the United States, and leaders must identify and harness them to fully maximize regional or state-wide potential.
- **Recognizing technology can be both an opportunity and a barrier.** Lack of access to reliable broadband continues to prevent rural populations from contributing to their full extent. On the other hand, telework can be a useful tool for meeting talent where it is. Similarly, telehealth can widen healthcare impact by giving neglected communities a channel to communicate with medical professionals.

Policy action items:

- Build trust between institutions to bolster the productive capacity of research partnerships.
- Some incredibly isolated areas with low population density may not feasibly become incorporated into the innovation ecosystem. If this is the case, Working Group 4 emphasized that leaders must consider ways to draw in talent from these regions.
- The group posited that the current investment systems are failing to adequately support all levels of innovation. Regional leaders should work to attract venture capital, but they should also explore other opportunities to grow ready access to capital for the sustainability of their startup ecosystem.
- Lower the costs and increase accessibility to healthcare to drive entrepreneurship, as both costs and limited access often prevent workers from pursuing an entrepreneurial path.



Above pictures: Breakout Group 4.

Conclusion and Next Steps for the Commission

Summit Wrap-Up



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



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

Moderator



Dr. Edward Seidel
President
University of Wyoming
[National Commissioner](#)

As the Commission is moving into the next phase and re-starting the Working Group Sessions this fall, co-hosts of the Summit reflected on some of the key issues that need to be addressed in these workshop style conversations to develop the next set of recommendations in 2023.

Regional Innovation and Geographic Inclusion

Rural areas and regions outside of the traditional innovation hubs need to be included in the innovation ecosystem. The NSF's Established Program to Stimulate Competitive Research (EPSCoR), which seeks to enhance the research competitiveness of specific states or regions through strategic investments in talent development and local infrastructure, is a prime example of such an effort. Dr. Seidel articulated that programs like EPSCoR, paired with sizeable grants for research at universities, can be channeled into economic development in rural places like Wyoming that have traditionally lacked the resources to be full participants in the innovation ecosystem.

The Council has long focused on place-based innovation as a driver of national growth. The Council's **Regional Clusters of Innovation** work in the late 1990s with Professor Michael Porter, Harvard Business School, set the stage for how the Council approaches place-based innovation today. The Hon. Wince-Smith recounted the city of San Diego's rise to becoming one of the nation's pre-eminent wireless networking hubs, which occurred thanks to a partnership between the U.S. Navy and a small startup now known as Qualcomm. San Diego is a bustling center for naval bases and fleets in the Pacific, which Qualcomm's founder was able to uniquely leverage into a partnership with the government. Building on this contractual relationship, Qualcomm became San Diego's anchor company, and has elevated the city on the national scale. This story highlights how the distinct features of cities and regions across the country offer competitive advantages that others simply do not.

The United States is dotted with former manufacturing hubs that have been shut down and hollowed out. Anchor enterprises can revitalize these regions. Intuit, for example, has begun to revitalize parts of Detroit as a result of establishing new facilities in the city. In contrast, Amazon's decision to build a facility in Northern Virginia rather than a city that needs the infusion of capital and jobs serves as the antithesis of the Council's place-based innovation efforts. The Hon. Wince-Smith asked Working Group 4, focused on place-based innovation, to discuss the role of anchor companies in developing productive capacity and human capital.

Creating a University Innovation Culture

Leaders of national laboratories have expressed concern that too many universities share an aversion to change that is stunting the potential for R&D in the United States. Universities must be willing to take risks and think innovatively. As institutions that shape the next generation of productivity and growth, universities must adapt and change to meet new demands. Conservative approaches to university R&D has stifled the scope of research. To continue to compete internationally, the United States must actively encourage universities to venture into the unknown.

Dr. Seidel emphasized the role culture plays in the productivity of university researchers. Encouraging innovation at a cultural level at universities can help cultivate the attitudes that induce productive R&D.

Addressing Public Aversion to the Energy Transformation

Dr. Wagner observed a lack of discussion about the public perception and public attitudes toward an energy transition. As a nuclear scientist, he recognizes that the general public's resistance to new energy sources is slowing the evolution of energy consumption. Attendees were asked to consider how to deal with the public's lack of support, especially given the transformational potential of new energy sources. He also lamented the barriers to energy development that slow innovation in the sector,

“We see the work of the National Commission as thought leadership around new ideas, but also as a test bed for our country, and I think all the ingredients (national labs, companies, academia, labor) are here to make this a success.”

The Hon. Deborah L. Wince-Smith
President & CEO
Council on Competitiveness

remarking that no amount of funding can accelerate the timelines imposed by regulations. Much of the discussion centered around smart investments without addressing how leaders can accelerate development.

Examine New Finance Models for Innovation

The United States needs to re-examine its financing models to compete with an international push for dominance in AI and quantum computing. The current venture capital-based innovation system does not incentivize firms to invest in startups that require deep manufacturing. As a result, important ideas that may require complex or expensive inputs go unfunded. Reconceptualizing investment incentives for venture capital firms is a key adjustment the United States should consider to properly fund disruptive technologies. The Commission also plans to build on its policy recommendations from [Competing in the Next Economy](#) and is considering supporting the creation of a National Infrastructure Bank.

Examine the Role of the Private Sector in the Innovation Ecosystem

The Hon. Wince-Smith noted that previous discussion among the working groups did not adequately account for the unique role the private sector plays in the innovation ecosystem. Much of the critical infrastructure in the United States is in the hands of the private sector, which employs the necessary developers and operators. The Hon. Wince-Smith encouraged working groups to delineate the role the private sector will play, emphasizing that the innovation ecosystem cannot survive without a thriving, vibrant private sector. Joining the massive investments in technology and infrastructure in partnerships with the private sector will be crucial to the successful implementation of innovation policy.

Next Steps for the Commission

The Summit, conceived and held under the auspices of the Commission, helped to pilot some of the Commission's phase 2 agenda. Building off the four Summit breakout groups, the Council will ask National Commissioners to have colleagues serve as co-chairs of each group. Additionally, the Council will turn to its general membership and community to participate in the working groups.

The Council expanded on the new concepts and thought leadership created at the Mountain West Innovation Summit during a meeting of the Council Board, Executive Committee, and National Commissioners in Washington, D.C., on July 13, 2022.

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WYOMING COWBOY CHRIS NAVARRO

THE SILHOUETTE OF A COWBOY RIDING A BUCKING HORSE HAS LONG BEEN THE SYMBOL OF THE STATE OF WYOMING. THE COWBOY
RIDING A BUCKING HORSE REPRESENTS THE COURAGE, SPIRIT, AND INDEPENDENCE OF WYOMING.
THE SCULPTURE HAS BEEN MODELED ON THE GREAT BUCKING HORSE STEAMBOAT. THIS FAMOUS BUCKER BRED IN WYOMING WAS
VOTED "WORST" BUCKING HORSE OF THE YEAR AT THE CHEYENNE FRONTIER DAYS CELEBRATION IN 1998 AND 1999. STEAMBOAT WAS
JET BLACK WITH THREE WHITE SOCKS AND HAD A POWERFUL BUILD. WHEN HE WAS A COLT, HE SUSTAINED A BROKEN BONE IN HIS
HOOF THAT CAUSED HIM TO MAKE A WHISTLING SOUND WHEN HE BUCKED. AND THAT IS WHY THE COWBOYS GAVE HIM THE NAME
STEAMBOAT. THE OLD-TIME COWBOYS SAID STEAMBOAT WOULD BUCK HIS HEART OUT AND WOULDN'T QUIT.

THE SCULPTURE SHOWS THE DETERMINATION AND SPIRIT OF BOTH THE HORSE AND THE RIDER IN A CONTEST OF ONE MAN AGAINST
ONE HORSE. IN THE EARLY DAYS OF RIDING, TO MAKE A QUALIFIED RIDE, A COWBOY HAD TO STAY AROUND HIS HORSE UNTIL IT CAME
TO A STANDSTILL. THE RIDER WAS NOT ALLOWED TO PULL LEATHER OR GRAB ANY PORTION OF THE SADDLE. HE WAS ALLOWED TO
FAN THE HORSE WITH HIS HAT, WHICH DRESSED THE RIDE UP AND MADE THE HORSE BUCK HARDER. THE SCULPTURE GARNERS THE
BRAND AND SYMBOL OF THE UNIVERSITY OF WYOMING. BOTH REPRESENT OUR WESTERN HERITAGE AND THE BEST OF WYOMING.

CHRIS NAVARRO

WYOMING COWBOY WAS MADE POSSIBLE BY A GIFT FROM BRUCE AND KATHY BLUMER.



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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 laboratory 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.