



Compete.

Council on
Competitiveness

Making Impact

2018–2019 Report

Letter from the President & CEO

2018 was a memorable year for the Council on Competitiveness (Council)—for recognition of our significant impacts on American public policy, for leadership transitions, and for the emergence of several major, new initiatives that will shape our agenda for years to come.

In May 2018, the National Science Board—the policymaking body for the National Science Foundation and the advisory body to the president and Congress on science and engineering issues—bestowed the Council with its highest honor: the 2018 National Science Board Public Service Award. This prestigious award honors groups that have made substantial contributions to increasing public understanding of science and engineering in the United States. This milestone achievement is a testament to the Council's three decades of work to create a national movement to recognize and support the roles of science, engineering, technology and innovation as key drivers of long-term productivity growth and inclusive prosperity.

2018 also marked significant transformations in the Council's leadership. At the end of 2018, Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, stepped down after serving for nine distinguished years as Chairman of the Council. Under Mr. Allen's leadership, the Council set a new competitiveness agenda for the nation, carried out numerous groundbreaking initiatives and expanded our engagement with the country's leaders in business, academia, labor and government, gaining

insight on the competitiveness challenges the United States faces, and developing pathways forward to solutions and a stronger economic future. Mr. Allen will be assuming the role of the Council's Chairman Emeritus.

Following Mr. Allen's transition, we have had the good fortune to build on his deep legacy and welcome a very strong, new slate of board members. In January 2019, Dr. Mehmood Khan, Chief Executive Officer of Boston-based Life Biosciences, Inc., assumed the Chairmanship of the Council. Joining Dr. Khan on the Board are the Council's new Industry Vice-chair, Mr. Brian T. Moynihan, Chairman and Chief Executive Officer, Bank of America; and our new Labor Vice-chair, Mr. Lonnie Stephenson, International President, IBEW. Dr. Michael M. Crow, President, Arizona State University, remains our University Vice-chair.

On the programmatic front, 2018 was also a year of major milestones, successful endings and exciting beginnings. The Council brought to a close the current phase of its longstanding Energy and Manufacturing Competitiveness Partnership with the release of two studies: *Accelerate: Turbocharging the Manufacturing Renaissance in an Era of Energy Abundance* and *Secure: Ensuring Resilience and Prosperity in a Digital Economy*. Building on its longstanding expertise at the cutting-edge of advanced computing, the Council launched a new initiative supported by the National Science Foundation to bolster America's National Strategic Computing Initiative: Building University-Industry-Lab Dialogues (BUILD) for Advanced Computing. And 2018-2019 stands out as the 10th anniversary of the Council's Technology Leadership



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



Council on Competitiveness Receives National Science Board Award

On May 2, 2018, the National Science Board presented the Council with the Public Service Award during the National Science Foundation Annual Awards Ceremony held in Washington, D.C. The Board established the award in 1996. The annual award recognizes people and groups (e.g., companies, corporations, organizations) that have been instrumental in increasing the public's understanding and appreciation of science or engineering. Past award recipients include the American Museum of Natural History, the Alfred P. Sloan Foundation, PBS television series NOVA, The Expanding Your Horizons Network, the Sea Education Association (SEA) and, in the previous year, the Challenger Center.



Left, standing left to right: Mr. William Bates, Executive Vice President, Council on Competitiveness; Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group; Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc; Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences Inc., and Chairman, Council on Competitiveness; Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness. *Seated:* The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness.

Right: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness, receives the National Science Board Public Service Award from Dr. Vicki Chandler, Dean of Faculty, Minerva Schools at KGI.

& Strategy Initiative, our gathering of the nation's top chief technology officers from industry, academia and the national laboratories.

And, anticipating our new Board and its emerging priorities, the 2018 *Clarion Call*—released December 9 at the National Competitiveness Forum (NCF)—made the case for a renewed effort to bolster U.S. innovation potential. The *Clarion Call* and 2018 NCF set the stage for the launch of the Council's new, multi-year flagship initiative: the National Commission on Innovation and Competitiveness Frontiers (Commission).

The Commission, chaired by Dr. Khan, Dr. Crow, Mr. Moynihan and Mr. Stephenson, aims to bring together America's top minds from industry, academia, labor and national laboratories to: confront and overcome the critical challenges to U.S. innovation capacity and capability; create momentum across the country to outpace the rest of the world's innovation efforts; build on the Council's deep history in defining and articulating America's innovation movement; and develop new-to-the-world partnerships to launch and scale innovation-based research, businesses and ventures in the United States.

Council on Competitiveness Announces New Chairman, Additions to Board Leadership

Heads of Bank of America, IBEW join leaders from Life Biosciences, Arizona State University and Deere & Co.



Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness.



Mr. Brian T. Moynihan, Chairman and Chief Executive Officer, Bank of America, and Industry Vice-chair, Council on Competitiveness.



Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness.



Mr. Lonnie Stephenson, International President, IBEW, and Labor Vice-chair, Council on Competitiveness.

The Council on Competitiveness (Council) welcomed new leaders from among America's largest corporations and labor unions to its board of directors, marking a new era in the organization's 33-year history.

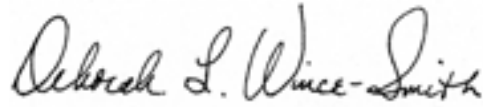
Effective January 1, 2019, Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., assumed the Chairmanship of the Council's board. Khan succeeds Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, who will remain on the board as Chairman Emeritus. Also joining the board as Industry Vice-chair is Brian T. Moynihan, Chairman and Chief Executive Officer, Bank of America, and as Labor Vice-chair is Lonnie Stephenson, President, IBEW. Michael M. Crow, President, Arizona State University, will continue in the role of University Vice-chair.

"The Council is honored and privileged to have the tremendous leadership and guidance of our new board members, all of whom are committed to our core mission of driving U.S. competitiveness through strong productivity growth, a rising standard of living for all Americans and expanded access to global markets," commented the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

The Council's board oversees the organization's financial well-being and sets its overarching policy agenda. "The Council is uniquely situated with its diverse membership to assess U.S. economic performance and focus policymaker attention on those areas of greatest impact. Further, because of its non-partisan reputation, the Council stands as an honest broker during this time of hyper politicization. I am

Looking forward, the Council will seek to broaden further its membership and engage CEOs, college and university presidents, labor leaders and national laboratory directors, as well as top government officials, on critical aspects of the competitiveness landscape. We urge your participation in shaping the Council's agenda to create an unparalleled competitive advantage for the nation.

Sincerely,



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



Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness.

excited and humbled by the opportunity to lead this remarkable organization," stated Khan.

Added Moynihan, "The companies represented in the Council are helping drive the U.S. economy and creating opportunities across our country. I'm pleased to join the group and share the perspectives we have from serving one in two

households and businesses of every size."

Since the Council's founding in 1986, labor unions have been a critical voice around the Council table joining with industry, academia and the national laboratories. "From my first meeting with the Council, it was clear that this is a different kind of Washington institution focused on policy solutions to the myriad of challenges facing this country, not on who is winning or losing politically. They have always seen the importance of having labor unions engaged in their work and I welcome the opportunity to carry on that legacy," commented Stephenson.

The Council's board meets twice annually in Washington, D.C., and will play a leadership role on the recently announced National Commission on Innovation and Competitiveness Frontiers.

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COMPETE: LEADERSHIP

2018 National Competitiveness Forum



The Council on Competitiveness (Council) hosted the 2018 National Competitiveness Forum (NCF) on November 28 at the Ronald Reagan Building and International Trade Center in Washington, D.C.



The preceding evening on November 27 at the National Museum of Women in the Arts, the Council hosted its Annual Dinner in honor of outgoing Chairman, Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company.





“Innovation is a key enabler, and innovation to me is not inventing another widget. Innovation to me is taking the inventions that often already exist and in a systematic manner, optimizing them.”

Dr. Mehmood Khan

Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness



“We’ve got to find ways educationally to accelerate our innovation to become more efficient while becoming better at the same time.”

Dr. Michael Crow

President, Arizona State University, and University Vice-chair, Council on Competitiveness

OPPOSITE PAGE

Top: Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness; Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc; Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness.

Center: Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness.

Bottom: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.



Top: Mr. Rich Penkoski, National Managing Principal, Consumer and Industrial Products Industry, Deloitte; Dr. Paul Kearns, Director, Argonne National Laboratory; Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness; Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc; Mr. Jim Clifton, Chairman and Chief Executive Officer, Gallup; Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; and Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness.

Top left: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

Top right: Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness.

Bottom: The Honorable Sylvia M. Burwell, President, American University; and Gen. Richard Myers, President, Kansas State University.



The speakers and panelists at the 2018 NCF addressed key facets of the U.S. competitiveness agenda, sharing thought-provoking ideas and examples of groundbreaking innovations in technologies and systems with the power to drive productivity. The event allowed senior leadership from industry, government, labor, academia and the national laboratories to engage across sectors and between government and the private sector to forge new pathways and partnerships with the potential for maximum economic impact. Inspired by transitioning initiatives and newly-launched programs, the speakers sparked discussions on topics that included disruptive new technologies, cybersecurity, workforce issues, energy and manufacturing, and the future of transportation. The dialogues at the NCF challenged the nation's leaders to think beyond the short-term and look to the future of American competitiveness and the job- and value-creating innovations of tomorrow.



Top: Ms. Niloofar Razi Howe, former Chief Strategy Officer and Senior Vice President of Strategy and Operations, RSA; Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group; Dr. Steve Ashby, Director, Pacific Northwest National Laboratory; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

Bottom: Mr. John Chisolm, Chief Executive Officer, John Chisholm Ventures; Dr. Michael Witherell, Director, Lawrence Berkeley National Laboratory; Dr. Ruth V. Watkins, President, University of Utah; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

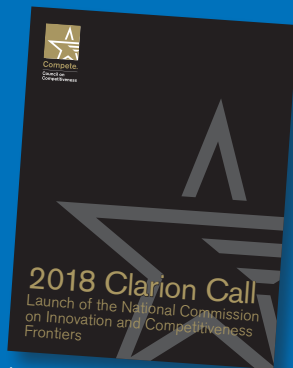
2018 *Clarion Call*

More than any country in history, the United States has been the greatest driver and beneficiary of technology, innovation and a vibrant entrepreneurial spirit.

The 2018 *Clarion Call* examines major, emerging challenges to this distinctive competitive advantage—exploring their implications and developing recommendations for action.

Notwithstanding a currently robust economy—rising and strong economic, productivity and job growth; historically low unemployment; wage increases; an improved tax environment; etc.—the Council believes U.S. leadership in technology and long-term competitiveness are under threat.

The *Clarion Call* lays out a range of critical challenges to the nation, but also sets the stage for the formation of the Council's flagship National Commission on Innovation and Competitiveness Frontiers to provide leadership and solutions.



“The current level of technology is not enough to pull the world. If we don’t have either a major policy shift or a different step in technology, the world will not make it on the fast track.”

Mr. Charles O. Holliday, Jr.
Chairman
Royal Dutch Shell plc

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Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc; Dr. Robert Johnson, Chancellor, University of Massachusetts, Dartmouth; and Dr. Martin Keller, Director, National Renewable Energy Laboratory.

OPPOSITE PAGE

Dr. Mark Peters, Director, Idaho National Laboratory; Mr. Sean McGarvey, President, NABTU; and Mr. William Bates, Executive Vice President, Council on Competitiveness.



Speakers at the 2018 NCF included the Honorable Wilbur L. Ross, Jr., Secretary, United States Department of Commerce; the Honorable Janet A. Napolitano, President, University of California System-Regents; Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness; Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness; Mr. James K. Clifton, Chairman and CEO, Gallup, Inc.; Mr. John E. Schlifske, Chairman, President and Chief Executive Officer, Northwestern Mutual; Mr. Matt Levatich, Chief Executive Officer, Harley Davidson; Mr. Nicholas Pinchuk, Chairman and Chief Executive Officer, Snap-on Incorporated; Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group; and Mr. Knudt H. Flor, President and CEO, BMW Manufacturing Co., LLC.

2018 National Competitiveness Forum Sponsors

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University of Massachusetts Dartmouth

University of Michigan

University of Wisconsin—Madison

Whitecap Investments, LLC



“Global industrial competitiveness continues to be one of our greatest and most complex national challenges.”

The Honorable Wilbur L. Ross, Jr.,
Secretary
U.S. Department of Commerce

Keynote Address

Delivering a keynote address and sharing the Trump Administration’s agenda and priorities for U.S. Competitiveness, Secretary Ross provided perspectives both on how a workforce can drive U.S. innovation and on the administration’s new policies aimed at improving the effectiveness of federal R&D.



“To feed American innovation and grow our ability to compete, there is no better tactic than investing in the infrastructure of ideas at our public research universities.”

The Honorable Janet A. Napolitano
President
University of California System-Regents

Lunchtime Keynote

Dr. Napolitano delivered the lunchtime keynote address stressing the importance of funding public university research projects to propel American innovation—noting that public universities in particular give young researchers the opportunity to create innovative technology that can change the world and benefit the economy.

COMPETE: LEADERSHIP

Network of Leaders

2018 National Competitiveness Forum



**OPPOSITE PAGE**

Top left: Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group.

Top right: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and the Honorable Alexander "Andy" Karsner, Founder, Elemental, an affiliate of the Emerson Collective.

Center left: Dr. Michael Witherell, Director, Berkeley National Laboratory; Dr. Christian Foster; and the Honorable France A. Córdova, Director, National Science Foundation.

Center right: Mr. Michael Kratsios, Deputy Assistant to the President, and Deputy Chief Technology Officer, The White House; and Dr. Mark Sims; Co-Chair, Joint Program Office for Strategic Computing, U.S. Department of Defense.

Bottom left: Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

Bottom right: Mr. Phil Ruhlman, Managing Partner, Gallup; Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness; Ms. Christine Sheehan, Chief of Staff, Gallup; and Mr. Jim Clifton, Chairman and CEO, Gallup.

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Top left: Dr. Glen A. Lewis, Advisor, CA Institute for Food & Agriculture, University of California, Davis; Ms. Margaret Brooks, Senior Manager, Enterprise Innovation & 5G Solutions; and Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group.

Top right: Ms. Michelle La Plante, Senior Manager, International Affairs, Deere & Company; Mr. Charles Stamp, Vice President, Corporate Strategy & Business Development, Deere & Company; Dr. J.B. Penn, Chief Economist, Deere & Company; and Ms. Sarah Dean, Senior Manager, International Affairs, Deere & Company.

Bottom: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Dr. Elisa Stephens, President, Academy of Arts University.



**OPPOSITE PAGE**

Top: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Mr. John Rogers, CEO and Founder, LM Industries; Dr. Mark Sims, Co-Chair, Joint Program Office for Strategic Computing, U.S. Department of Defense; Dr. Jim Clements, President, Clemson University; Mr. Knudt Flor, President & CEO, BMW Manufacturing Company LLC.; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

Bottom left: Dr. Christian Foster; the Honorable France A. Córdova, Director, National Science Foundation; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Brian Stone, Chief of Staff, National Science Foundation.

Bottom right: Mr. Larry Weber, Chairman and CEO, Racepoint Global; Mr. William Bates, Executive Vice President, Council on Competitiveness; and Dr. Mohammad Zaidi, former Chief Technology Officer, Alcoa, and Distinguished Fellow, Council on Competitiveness.

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Top: Dr. Steve Ashby, Director, Pacific Northwest National Laboratory; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Dr. Thomas Mason, Director, Los Alamos National Laboratory; Dr. Martin Keller, Director, National Renewable Energy Laboratory; and Dr. Steven Koonin, Director, Center for Urban Science and Progress, New York University, and Distinguished Fellow, Council on Competitiveness.

Bottom: Ms. Chrintine Sheehan, Chief of Staff, Gallup; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.



Top: Mr. Robert Reynolds, Chief Executive Officer, Putnam Investments.

Bottom: Mr. Matthew Levatich, President and Chief Executive Officer, Harley Davidson, Inc.

Top: Mr. David Seaton, Chairman and Chief Executive Officer, Fluor.

Bottom: Dr. Michael Lovell, President, Marquette University; and Mr. John E. Schlifske, Chairman and CEO, Northwestern Mutual Fund.



Top: Dr. Jim Clements, President, Clemson University; and Mr. Knudt Flor, President & CEO, BMW Manufacturing Company LLC.

Bottom: The Honorable Rebecca M. Blank, Chancellor, University of Wisconsin–Madison; and the Honorable Janet A. Napolitano, President, University of California System–Regents.

Top: Mr. Nicholas T. Pinchuck, Chairman and Chief Executive Officer, Snap-on Incorporated; Dr. William H. Goldstein, Director, Lawrence Livermore National Laboratory; the Honorable Rebecca M. Blank, Chancellor, University of Wisconsin–Madison; and Dr. Mark Schlissel, President, University of Michigan.

Bottom: Mr. John Rogers, Founder and Chief Executive Officer, LM Industries.

COMPETE: LEADERSHIP**National Commission on Innovation and Competitiveness Frontiers****INITIATIVE CO-CHAIRS**

Dr. Mehmood Khan
 Chief Executive Officer
 Life Biosciences, Inc., and
 Chairman
 Council on Competitiveness



Dr. Michael M. Crow
 President
 Arizona State University, and
 University Vice Chair
 Council on Competitiveness



Mr. Brian T. Moynihan
 Chairman and Chief Executive
 Officer
 Bank of America, and
 Industry Vice-chair
 Council on Competitiveness



Mr. Lonnie Stephenson
 International President
 IBEW, and
 Labor Vice-chair
 Council on Competitiveness

While the United States has stood apart from the rest of the world during the past half century for its record of sustained innovation, across industries old and new, and through the ups and downs of economic cycles, the nation today faces new realities and imperatives:

1. The nation faces existential challenges to its global leadership in innovation. On the one hand, other nations are rapidly replicating the structural advantages that have differentiated the United States. But on the other hand, nations and regions are developing their own, distinctive innovation ecosystems, which may not be compatible with the U.S. system.
2. The nature of innovation itself has morphed—becoming dramatically more interconnected, turbulent and multi-disciplinary.
3. The pursuit of innovation is changing. An innovator today can imagine, develop and scale a disruptive technology independent of traditional institutions of innovation, with entirely new business models.

Under the chairmanship of Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness; Mr. Brian T. Moynihan, Chairman and Chief Executive Officer, Bank of America, and Industry Vice-chair, Council on Competitiveness; and Mr. Lonnie Stephenson, International President, IBEW, and, Labor Vice-chair, Council on Competitiveness, the Council's Board and

Executive Committee have called for the formation of the National Commission on Innovation and Competitiveness Frontiers (Commission), a multi-year effort to focus on America's innovation and competitiveness challenges and opportunities.

Year in Review

The Commission soft launched at the 2018 NCF on November 28, 2018, in the Ronald Reagan Building and International Trade Center in Washington, D.C. The case for the Commission's launch was laid out by the Council's 2018 *Clarion Call*, which illustrated a number of potentially disruptive U.S. economic trends and identified key challenges to America's technological leadership and long-term competitiveness.

Critical issues to be undertaken by the Commission were discussed by a panel of Council members to open the NCF. Those discussing the path to optimize the nation for a new innovation and competitiveness future included Dr. Khan and Dr. Crow, as well as:

- Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company; and Chairman Emeritus, Council on Competitiveness;
- Mr. Jim Clifton, Chairman and Chief Executive Officer, Gallup;
- Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc; former Chairman, Council on Competitiveness;
- Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin, and Co-chair, Technology Leadership & Strategy Initiative, Council on Competitiveness;
- Dr. Paul Kearns, Director, Argonne National Laboratory; and
- Mr. Rich Penkoski, National Managing Principal, Consumer and Industrial Products Industry, Deloitte.



“We need to be thinking about the infrastructure of science and technology with this commission in a much more broad and holistic fashion.”

Dr. Keoki Jackson

Vice President and Chief Technology Officer
Lockheed Martin

Pictured to the right of Dr. Jackson, Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc.

Following the panel, Commission co-chairs Dr. Khan and Dr. Crow were joined by Dr. Jackson for a conversation with Gallup exploring their perspectives on the importance and need for the Commission. This conversation will be utilized by Gallup to develop a new product to gain broad stakeholder perspectives on national priorities for the Commission to address.

Outlook

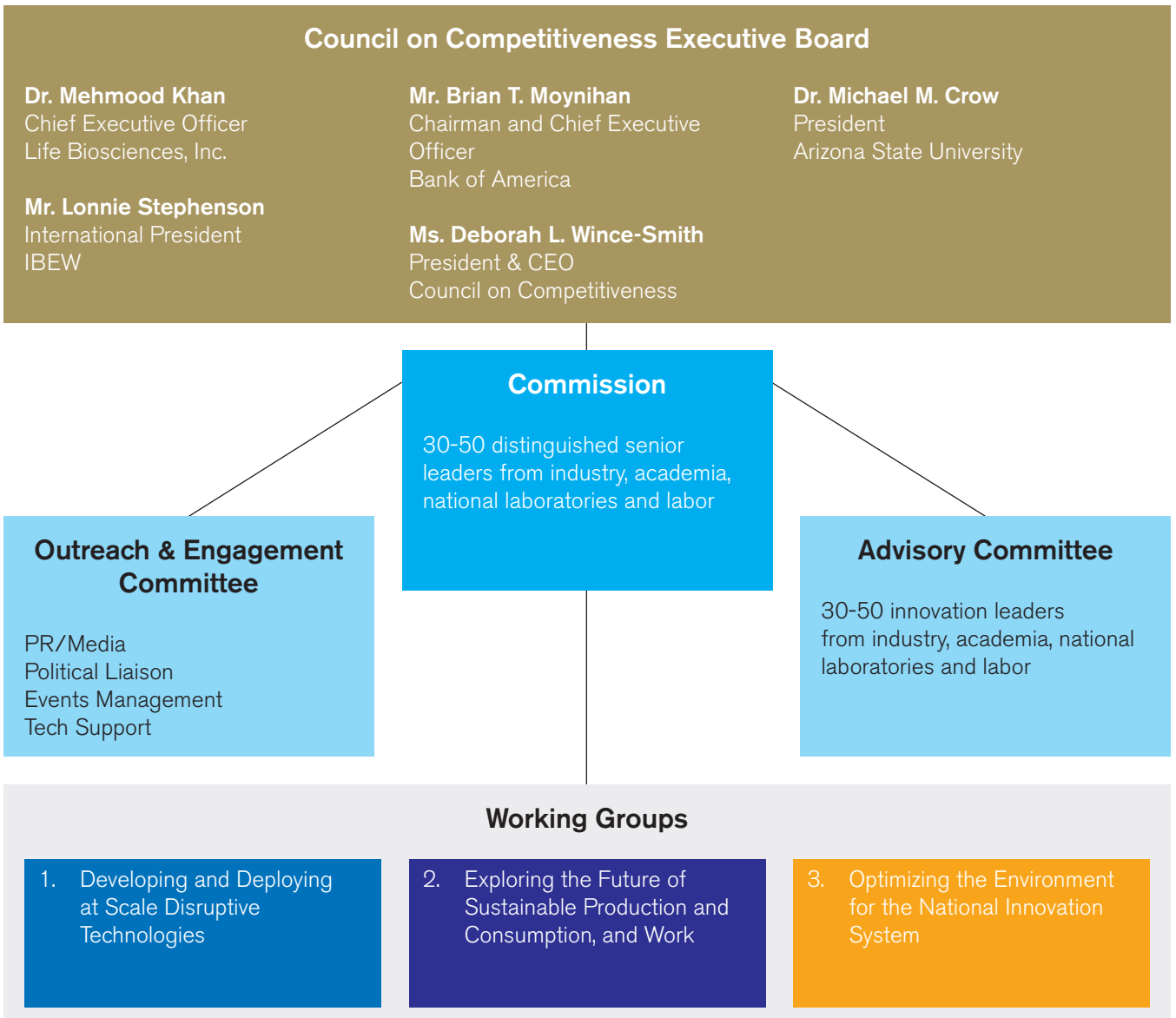
Despite significant strengths in its innovation capabilities and capacities—documented in the Council's 2018 *Clarion Call*—U.S. competitiveness is dynamic and ever transforming. And the nation's comparative position in the global competitiveness arena can change rapidly. Now and into the future, U.S. companies, industries, and national and regional economies that expect to compete will have to rise to the challenge of this dynamic and reorganize for an age of growing technological, economic and political disruption. Our government, communities and our education system must be prepared to support rapid change, and help those who are displaced or negatively affected by technological and competitive changes. When the United States controlled the

global direction of technology, we were positioned to control our economic destiny. That position is no longer guaranteed.

So, what will the United States do in the face of challenges at home and coming from abroad?

In the first year of the Commission's work, the Council will build a powerful set of recommendations, with Working Groups focused on three core pillars:

1. Developing and Deploying at Scale Disruptive Technologies;
2. Exploring the Future of Sustainable Production and Consumption, and Work; and
3. Optimizing the Environment for the National Innovation System.



Commissioners

As of July 26, 2019

Dr. Mehmood Khan, Co-chair

Chief Executive Officer
Life Biosciences, Inc., and
Chairman
Council on Competitiveness

Dr. Michael Crow, Co-chair

President
Arizona State University, and
University Vice-chair
Council on Competitiveness

Mr. Brian Moynihan, Co-chair

Chairman and Chief Executive
Officer
Bank of America, and
Industry Vice-chair
Council on Competitiveness

Mr. Lonnie Stephenson, Co-chair

International President
IBEW, and
Labor Vice-chair
Council on Competitiveness

Dr. Steven Ashby

Director
Pacific Northwest National
Laboratory

Dr. Dennis Assanis

President
University of Delaware

Dr. Mark Becker

President
Georgia State University

Mr. John Chachas

Managing Partner
Methuselah Advisors

Mr. Jim Clifton

Chairman and CEO
Gallup

Dr. Victor Dzau

President
National Academy of Medicine

Dr. Taylor Eighmy

President
The University of Texas at San
Antonio

The Honorable Patricia Falcone

Deputy Director for Science
and Technology
Lawrence Livermore National
Laboratory

Mr. George Fischer

Senior Vice President and
President, Global Enterprise
Verizon Business Group

Ms. Janet Foutty

Chair of the Board
Deloitte

Dr. Wayne A. I. Frederick

President
Howard University

Dr. W. Kent Fuchs

President
University of Florida

Ms. Joan T.A. Gabel

President
University of Minnesota

Dr. Sheryl Handler

President and CEO
Ab Initio

Mr. Charles O. Holliday, Jr.

Chairman
Royal Dutch Shell plc

Mr. G. Michael Hoover

President & CEO
Sundt Construction

The Honorable Steven J. Isakowitz

President and Chief Executive
Officer
The Aerospace Corporation

Dr. Keoki Jackson

Vice President and Chief
Technology Officer
Lockheed Martin

Dr. Robert Johnson

Chancellor
University of Massachusetts
Dartmouth

Dr. Paul Kearns

Director
Argonne National Laboratory

Dr. Pradeep Khosla

Chancellor
University of California, San
Diego

Dr. Timothy Killeen

President
University of Illinois System

Dr. René Lammers

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PepsiCo, Inc.

Dr. Laurie Leshin

President
Worcester Polytechnic Institute

Dr. Thomas Mason

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Los Alamos National
Laboratory

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Chancellor
University of California, Davis

Dr. Jonathan McIntyre

Chief Executive Officer
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Gen. Richard Myers

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Idaho National Laboratory

Dr. Edward Ray

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Oregon State University

Dr. M. David Rudd

President
University of Memphis

Dr. Cathy Sandeen

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Anchorage

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President
Washington State University

Dr. Elisa Stephens

President
Academy of Art University

Dr. Claire Sterk

President
Emory University

Mr. Steven Stevanovich

Chairman and CEO
SGS Global Holdings

Mr. Sridhar Sudarsan

Chief Technology Officer
SparkCognition, Inc.

Mr. Andrew M. Thompson

President & Chief Executive
Officer
Proteus Digital Health

Dr. Satish Tripathi

President
The University at Buffalo

Dr. Satish Udpa

Interim President
Michigan State University

Dr. Marty Vanderploeg

Chief Executive Officer and
President
Workiva

Dr. Kim Wilcox

Chancellor
University of California,
Riverside

The Honorable Deborah L. Wince-Smith

President & CEO
Council on Competitiveness

Dr. Wendy Wintersteen

President
Iowa State University

Dr. Michael Witherell

Director
Lawrence Berkeley National
Laboratory

Dr. W. Randolph Woodson

Chancellor
North Carolina State University

Dr. Thomas Zacharia

Director
Oak Ridge National Laboratory

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On the Hill

Council President Joined Leaders in Testifying on U.S. Energy Innovation

On February 7, 2019, the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness, testified before the Senate Committee on Energy and Natural Resources on the status and outlook of energy innovation in the United States. Her testimony built on the Council's two-plus decades of work in this space.

Ms. Wince-Smith joined panelists the Honorable Paul M. Dabbar, Undersecretary for Science, U.S. Department of Energy; the Honorable Ernest Moniz, President & CEO, Energy Futures Initiative; Mr. Jason Grumet, President, Bipartisan Policy Center; Mr. Jay Faison, Founder, ClearPath; and Mr. James F. Wood, Interim Director, Energy Institute, West Virginia University, to make the case that policymakers must work together, across the aisle, to ensure the United States establishes the next-generation physical, regulatory and financial infrastructure needed to support the nation's advanced energy and manufacturing enterprise. This means investing in basic research, leading in critical technologies, catalyzing the power and potential of the American worker and securing critical energy infrastructure and next-generation innovation.

"This hearing comes at an important, possibly historic time for U.S. innovation," said Ms. Wince-Smith. "Given the profound impact of science and technology on every aspect of American lives, we should all be concerned with the nation's ability to lead in science, technology and innovation."



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

Innovation in the energy sector has been central to the Council's efforts over the last decade to drive America's advanced manufacturing enterprise in an era of energy abundance. Wince-Smith's testimony is largely informed by the Council's most recent initiatives and reports in this space: the American Energy and Manufacturing Competitiveness Partnership with the U.S. Department of Energy; *Accelerate: Turbocharging the Manufacturing Renaissance in an Era of Energy Abundance*; *Secure: Building Resilience and Prosperity in a Digital Economy*; and the 2018 *Clarion Call*. Together, these efforts and reports look back at the last decade, apply the lessons learned across a number of initiatives to present-day challenges and provide an outlook for the future of U.S. competitiveness as will be explored in a groundbreaking new initiative, the National Commission on Innovation and Competitiveness Frontiers.

CALENDAR OF EVENTS

2019

AUGUST 7

Launch Meeting

Host: Council on Competitiveness
Washington, D.C.

2020

JANUARY TBD

National Commission Working Group Launch Conference

Tempe, AZ

Council Chairman Testifies Before House Science Committee

On March 6, 2019, Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness, testified before the House Science, Space and Technology Committee on the importance of U.S. competitiveness in science and technology. Dr. Khan joined Council member, the Honorable Patrick D. Gallagher, Chancellor, University of Pittsburgh, and the Honorable Marcia McNutt, President, National Academy of Sciences of the United States.

Dr. Khan shared findings and recommendations from the Council's 2018 *Clarion Call* and articulated the case for the new flagship **National Commission on Innovation & Competitiveness Frontiers** that will be launched in Washington, D.C., on August 7, 2019.

“Given the profound impact of science and technology on U.S. prosperity, standards of living, national security, modern society and geopolitical standing, every American should be concerned with the nation's ability to lead in science, technology and innovation,” said Dr. Khan.



Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness.

The testimony coincided with the release of a new online survey conducted by Hart Research and Echelon Insights which found that 88 percent of voters believe it is important for the federal government to fund science and technology research, and 75 percent would feel more favorable toward a congressional candidate who supports increasing funding.



“The Commission will help define the rules of the road for this new competitiveness environment, so we are optimizing our laws, regulations and tax structure to support our leadership in critical technologies and industries.”

Mr. Samuel R. Allen
Chairman and Chief Executive Officer
Deere & Company, and
Chairman Emeritus
Council on Competitiveness

COMPETE: LEADERSHIP

University Leadership Forum



Dr. Michael R. Lovell, President, Marquette University; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Mr. Jere W. Morehead, President, University of Georgia; Dr. Laurie A. Leshin, President, Worcester Polytechnic Institute; Mr. Jonathan R. Alger, President James Madison University; Dr. M. David Rudd, President, University of Memphis; and Mr. William Bates, Executive Vice President, Council on Competitiveness.

Colleges and universities are critical components of the U.S. innovation ecosystem and are being called upon to play ever-evolving roles in research, economic development, skills training and life-long learning.

They are essential for building talent; achieving scientific breakthroughs; creating new technologies, products, companies and organizations; and contributing to the local economy. Yet, budgetary constraints and the rapid pace of change across the economy mean these expectations are under constant pressure.

Understanding, anticipating and promoting change in the current models for higher education is imperative for competitiveness in the 21st century. The University Leadership Forum enables leaders from America's top academic institutions to work in concert with each other and as part of the broader Council on Competitiveness (Council) membership—including CEOs, labor union leaders and the directors of national laboratories—to understand how the innovation landscape is changing, consider actions the institution might take, mobilize to lower or eliminate shared barriers, and identify potential innovation partners. While academia is the focus, industry and other stakeholders participate to share best practices on cooperation to continue relationships for innovation.

INITIATIVE CO-CHAIRS**University Leadership Forum**

Dr. Michael R. Lovell
President
Marquette University



Mr. Jere W. Morehead
President
University of Georgia



Dr. James R. Johnsen
System President
University of Alaska



Dr. Laurie A. Leshin
President
Worcester Polytechnic Institute

University-Industry-Government Partnerships Task Force

Dr. M. David Rudd
President
The University of Memphis



Dr. Ruth V. Watkins
President
University of Utah

Fusion of STEM & Liberal Arts Disciplines Task Force

Mr. Jonathan R. Alger
President
James Madison University



Dr. Adam S. Weinberg
President
Denison University

Year in Review

Inspired by the Global Federation of Competitive Councils' University and Research Leadership Forum, the Council launched the University Leadership Forum to understand how colleges and universities contribute to the competitiveness of the United States and to maximize the value they add to the U.S. economy. In year one, the University Leadership Forum will focus on three topics: extreme innovation, chaired by Dr. James A. Johnsen, President, University of Alaska System; university & industry partnerships, co-chaired by Dr. Laurie A. Leshin, President, Worcester Polytechnic Institute, Dr. Ruth V. Watkins, President, University of Utah, and Dr. M. David Rudd, President, The University of Memphis; and STEM and liberal arts, co-chaired by Mr. Jonathan R. Alger, President, James Madison University, and Dr. Adam S. Weinberg, President, Denison University.

The inaugural University Leadership Forum meeting was held on June 17, 2019, in Washington, D.C. The meeting formalized work streams and charters across the three task forces. Subsequent meetings later in the year will bring in outside expertise from among the Council membership and other stakeholders, including policymakers at the federal and state levels, to engage the broader community in the task forces and the broader University Leadership Forum agenda.

Outlook

As leaders come together, discussions will take place about sharing best practices, updates on new concepts, and the development of policy recommendations. The University Leadership Forum is intended both as an internal think tank for the Council on the critical role of higher education to U.S. competitiveness, and as an impact-making player in state and federal policymaking.

CALENDAR OF EVENTS

2019

JUNE 17

University Leadership Forum Inaugural Meeting

Host: Council on Competitiveness
Washington, D.C.

COMPETE: LEADERSHIP

Network of Leaders

2018 Executive Committee Meeting



Top: Mr. William Bohnett, Chief Executive Officer, Whitecap Investments, LLC; and Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group.

Bottom: Dr. Pradeep Khosla, Chancellor, University of California, San Diego; and Mr. Nicholas Pinchuck, Chairman and Chief Executive Officer, Snap-on Incorporated.

Top: Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness.

Bottom: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Nicholas Pinchuck, Chairman and Chief Executive Officer, Snap-on Incorporated.



Top: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group; and Dr. Pradeep Khosla, Chancellor, University of California, San Diego.

Bottom: Mr. Jim Clifton, Chairman and CEO, Gallup; and Mr. Steve Stevanovich, Chairman and CEO, SGS Global Holdings.

Top: Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc.; and Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc.

Bottom: Mr. Craig Giffi, Vice Chairman, Deloitte LLP; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.



Top: Mr. Steve Stevanovich, Chairman and CEO, SGS Global Holdings; and Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc.

Bottom: Mr. Chad Evans, Executive Vice President, Council on Competitiveness; and Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness.

Top: Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

Bottom: Mr. Steve Stevanovich, Chairman and CEO, SGS Global Holdings; Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness; and the Honorable Paul M. Dabbar, Under Secretary for Science, U.S. Department of Energy.



Top: Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc; Mr. Samuel R. Allen, Chairman and Chief Executive Officer, Deere & Company, and Chairman Emeritus, Council on Competitiveness; Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; the Honorable Paul M. Dabbar, Under Secretary for Science, U.S. Department of Energy; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Dr. Michael M. Crow, President, Arizona State University, and University Vice-chair, Council on Competitiveness.

Bottom: Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc; Mr. William Bates, Executive Vice President, Council on Competitiveness; and Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness.



COMPETE: INNOVATION**Technology Leadership & Strategy Initiative****INITIATIVE CO-CHAIRS****Dr. Klaus Hoehn**

Senior Advisor for Innovation and Technology to the Office of the Chairman
Deere & Company

**Dr. Keoki Jackson**

Vice President and Chief Technology Officer
Lockheed Martin

The United States has a long history of leadership in new technologies, products, processes and jobs that contribute to innovation-based economic growth and prosperity.

As global competition increases and barriers to innovation continue to fall, the Council's Technology Leadership & Strategy Initiative (TLSI) provides a distinctive forum for members to explore U.S. and global research partnerships and develop policies to preserve and invigorate the nation's technology leadership—a core driver of national productivity over the past half-century.



Dr. Barry Johnson, Division Director, Industrial Innovation and Partnerships, National Science Foundation; Dr. Philip Perconti, Director, U.S. Army Research Laboratory; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; Mr. Michael Kratsios, Deputy Assistant to the President, and Deputy Chief Technology Officer, The White House; the Honorable Walter Copan, Under Secretary for Standards and Technology, U.S. Department of Commerce, and Director, National Institute of Standards and Technology; Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; and Dr. Thomas Cabbage, Senior Advisor, Office of the Under Secretary for Science, U.S. Department of Energy.



Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; Mr. Chad Evans, Executive Vice President, Council on Competitiveness; and Dr. Klaus Hoehn, Advisor to the Chairman and CEO, Deere & Company.



Ms. Tristin Brisbois, Program & Portfolio Management Lead, Life Sciences, Global R&D, PepsiCo, Inc.; Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

The TLSI consists of 50+ Chief Technology Officers and research leaders at America's premier companies and institutions. Working together, these leaders identify and analyze technology trends, opportunities and challenges facing the country's technology leadership; facilitate partnerships between industry, university, government and national laboratories to accelerate innovation across the U.S. research and development landscape; and improve the nation's capacity for commercialization through investment in research and research infrastructure.

Year in Review

The past year has been one of deep and broad engagement for the TLSI with the Trump Administration and partners around the world.

The TLSI formally began its 2018 activities with Dialogue 18 of the TLSI's progressive dialogue series on June 8 with a meeting focused on Voices of the Administration. The TLSI and Council were honored to host several of the Trump Administration's science and technology leaders, including representatives from the White House, National Institute of Standards and Technology, U.S. Army Research Laboratory, National Science Foundation and the U.S. Department of Energy. TLSI members engaged directly

with these high-level members of the administration, who expressed appreciation and an interest in future collaborations with the group.

Building on the outcomes of this conversation, TLSI members sought pathways to amplify U.S.-based science, technology, talent and innovation at Dialogue 19 on October 30, 2018, by focusing on core competencies for optimizing national competitiveness: talent, collaboration, communication, and technology and innovation. The importance of this conversation again attracted high-level participants from the administration, including distinguished leaders from the U.S. Department of Defense, the National Aeronautics and Space Administration, the American Association for the Advancement of Science, and the U.S. Department of Homeland Security.

Participants at Dialogues 18 and 19 spent time outlining a proposed U.S.-Australia CTO Dialogue—a joint effort by the Council and Australia's Commonwealth Scientific and Industrial Research Organisation to create a platform for bilateral business development and research collaborations in areas primed to support long-term growth, higher living standards, and industry and job creation in both nations.



The Honorable Patricia Falcone, Deputy Director for Science and Technology, Lawrence Livermore National Laboratory; the Honorable Kelvin Droegemeier, Director, Office of Science and Technology Policy, The White House; Dr. Victor Dzau, President, National Academy of Medicine; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Dr. Klaus Hoehn, Senior Advisor, Innovation & Technology, Office of the Chairman, Deere & Company; Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

The Council kicked off 2019 with a tremendous advance in its TLSI agenda, engaging for the first time peer CTOs in a strategic partner nation. Council TLSI Co-chairs, Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; and Dr. Klaus Hoehn, Senior Advisor for Innovation and Technology to the Office of the Chairman, Deere & Company—along with the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness—led a delegation of TLSI members to Sydney for the inaugural U.S.-Australia CTO Dialogue, hosted by Mr. Larry Marshall, Council member and CSIRO Chief Executive (the Commonwealth Scientific and Industrial Research Organisation). The trip included a full immersion in the Australian innovation ecosystem—with critical deep dives into artificial intelligence, quantum computing, 3D tissue printing, blockchain, etc.—across Sydney, Canberra and Melbourne. A key outcome was the announcement of a 2nd U.S.-Australia CTO Dialogue, which will take place in Washington, D.C., on November 8 in conjunction with TLSI Dialogue 21, and which will be supported by a series of virtual working groups developing this summer and early fall a series of bilaterally focused recommendations to boost innovation potential and partnerships.



Dr. Victor Dzau, President, National Academy of Medicine; and Dr. Ushama Kriplani, Interim Associate Laboratory Director for Science and Technology, Partnerships and Outreach Directorate, Argonne National Laboratory.

TLSI Dialogue 20—in addition to summarizing the Australia events—also welcomed back former TLSI member, the Honorable Kelvin Droegemeier, Director, Office of Science and Technology Policy, The White House. The Director shared perspectives on the administration's priorities in long-term research and development, and sought TLSI input.

And the TLSI was honored to welcome Dr. Victor Dzau, President, National Academy of Medicine, who briefed the group on the academy's "grand challenge on healthy longevity."

In addition to welcoming peers from Australia, Dialogue 21 will be a stepping stone to evaluate progress in the development of the National Commission on Innovation and Competitiveness Frontiers.



CALENDAR OF EVENTS

2018

JUNE 8

TLSI Dialogue 18

Host: Council on Competitiveness
Washington, D.C.

OCTOBER 30

TLSI Dialogue 19

Host: Council on Competitiveness
Washington, D.C.

2019

MARCH 25-28

US-AUS CTO Dialogue

Host: Commonwealth Scientific and Industrial
Research Organisation
Sydney, Canberra and Melbourne, Australia

MAY 23

TLSI Dialogue 20

Host: Council on Competitiveness
Washington, D.C.

NOVEMBER 8

TLSI Dialogue 21

Host: Council on Competitiveness
Washington, D.C.

NOVEMBER 8

2nd US-AUS CTO Dialogue

Host: Council on Competitiveness
Washington, D.C.



Top left: The Honorable Kelvin Droegemeier, Director, Office of Science and Technology Policy, The White House.

Top right: Participants in the US-Australia CTO Dialogue hosted by Commonwealth Scientific and Industrial Research Organisation.

Bottom: The Honorable Walter Copan, Under Secretary for Standards and Technology, U.S. Department of Commerce, and Director, National Institute of Standards and Technology; and Mr. Michael Kratsios, Deputy Assistant to the President, and Deputy Chief Technology Officer, The White House.



Top left: Dr. Mehmood Khan, Chief Executive Officer, Life Biosciences, Inc., and Chairman, Council on Competitiveness; and the Honorable Walter Copan, Under Secretary for Standards and Technology, U.S. Department of Commerce, and Director, National Institute of Standards and Technology.

Top right: Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; and Dr. Larry Marshall, Chief Executive, Commonwealth Scientific and Industrial Research Organisation.

Center: Members of the Technology Leadership & Strategy Initiative at a dialogue held at the Council on Competitiveness Offices in Washington, D.C., in 2018.

Bottom: Dr. Sanjiv Malhotra, Director, Energy Investor Center, Office of Technology Transitions, U.S. Department of Energy; Dr. Thomas Cabbage, Senior Advisor, Office of the Under Secretary for Science, U.S. Department of Energy; and Dr. Philip Perconti, Director, U.S. Army Research Laboratory.





Top: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

Bottom: Dr. Alex Fowler, Associate Provost for Research and Economic Development, University of Massachusetts, Dartmouth; and Dr. Marianne Walck, Deputy Laboratory Director for Science and Technology and Chief Research Officer, Idaho National Laboratory.

Top: Dr. Bogdan Vernescu, Vice Provost for Research, Worcester Polytechnic Institute; the Honorable Patricia Falcone, Deputy Director for Science and Technology, Lawrence Livermore National Laboratory; the Honorable Kelvin Droegemeier, Director, Office of Science and Technology Policy, The White House; Dr. Victor Dzau, President, National Academy of Medicine; Dr. Ushma Kriplani, Interim Associate Laboratory, Director for S&T Partnerships and Outreach, Argonne National Laboratory; and Dr. Michael Bloom, Assistant Vice President, Office of Corporate Partnerships, University of South Florida.

Bottom: Mr. Sridhar Sudarsan, Chief Technology Officer, Spark-Cognition, Inc.; Dr. Klaus Hoehn, Senior Advisor for Innovation and Technology to the Office of the Chairman, Deere & Company; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.



Top: Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin; and Dr. Cathy Foley, Chief Scientist, Commonwealth Scientific and Industrial Research Organisation, at a dialogue in Sydney hosted by CSIRO.

Bottom: Dr. Bruce LaMattina, Associate Vice Chancellor for Research Development, University of Tennessee, Knoxville; Mr. Morgan Plummer, Managing Director, MD5, Office of the Under Secretary of Defense, U.S. Department of Defense; and Dr. Patrick Carrick, Chief Scientist, Science and Technology Directorate, U.S. Department of Homeland Security.

Top: Dr. Rustom Mody, former Vice President–Technical Excellence–Enterprise Technology, Baker Hughes, Inc, and Senior Fellow, Council on Competitiveness; Ms. Nicole Forrester, Director, Intergovernmental & Philanthropic Partnerships, Commonwealth Scientific and Industrial Research Organisation; and Ms. Veronica Quinless, Executive Manager, Business Development & Commercial, Commonwealth Scientific and Industrial Research Organisation, at the U.S.-AUS CTO Dialogue.

Bottom: Dr. Rustom Mody, former Vice President–Technical Excellence–Enterprise Technology, Baker Hughes, Inc, and Senior Fellow, Council on Competitiveness; Dr. Sethuraman “Panch” Panchanathan, Executive Vice President, Knowledge Enterprise, and Chief Research and Innovation Officer, Arizona State University; and Dr. Barry Johnson, Division Director, Industrial Innovation and Partnerships, National Science Foundation.

COMPETE: INNOVATION

BUILD for Advanced Computing

Funded by the National Science Foundation



Dr. Rob Rutenbar, Senior Vice Chancellor for Research, University of Pittsburgh; Dr. Farnam Jahanian, President, Carnegie Mellon University; Ms. Rebecca Bagley, Vice Chancellor for Economic Partnerships, University of Pittsburgh; the Honorable Patrick D. Gallagher, Chancellor, University of Pittsburgh; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

Drawing on more than 30 years of experience in helping to uncover, shape and develop public private partnerships, the Council on Competitiveness (Council)—with the support of the National Science Foundation (NSF)—launched in 2018 an effort to overcome a series of barriers to the development and deployment at scale of critical advanced computing assets.

The purpose of Building University-Industry-Lab Dialogue (BUILD) for Advanced Computing is to learn from past efforts—like the Council’s National Digital Engineering and Manufacturing Center (NDEMC) and recent, successful national manufacturing institutes across the U.S. Departments of Defense, Energy and Commerce—to increase the effectiveness of U.S. research and development efforts in advanced computing. BUILD will seek to identify new public-private partnership models to support next-generation advanced computing technologies—efforts as wide-ranging as high performance computing, quantum computing, artificial intelligence, machine learning, work to extend “beyond Moore’s Law,” etc.—at the heart of long-term economic and national security, productivity and inclusive prosperity.

BUILD was comprised of a series of three regional dialogues focused on identifying means to increase significantly the competitiveness of the U.S. high



performance and advanced computing R&D ecosystem for the benefit of U.S. industry and academia, and to define/outline high-impact public-private partnership model(s) to accomplish this goal.

Year in Review

On November 7, 2018, the Council kickstarted the national, progressive conversation series to imagine, conceptualize and propose to the NSF and the Joint Program Office (JPO) overseeing the National Strategic Computing Initiative (NSCI) a set of new-to-the world, public-private partnerships (PPPs) to spur the use of advanced computing to support federal missions in scientific discovery, national security and economic competitiveness.

November 7, 2018, marked the launch of BUILD, bringing together more than 40 participants from across industry, academia and government at the University of Pittsburgh to discuss how applications of advanced computing technologies can improve industrial productivity and support federal missions in scientific discovery, national security and economic competitiveness in the United States. The Pittsburgh dialogue focused on PPPs in three key areas important to the city's industrial and economic base: computing and information technology, health and wellness, and artificial intelligence.



Top: Mr. Chad Evans, Executive Vice President, Council on Competitiveness; Dr. Farnam Jahanian, President, Carnegie Mellon University; and the Honorable Patrick D. Gallagher, Chancellor, University of Pittsburgh.

Center: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. James B. Milliken, Chancellor, The University of Texas System.

Bottom: Dr. Taylor Eighmy, President, The University of Texas at San Antonio.



The second in the series of three dialogues was hosted by Council Executive Committee member Dr. Pradeep Khosla, Chancellor, University of California, San Diego, in partnership with the San Diego Supercomputer Center on March 11, 2019. The dialogue focused in part on potential PPP models to advance the future of microelectronics by highlighting both the dynamism of this industry in Southern California and the importance of promoting U.S. competitiveness in this critical, enabling technology.

Council Executive Committee member Mr. James B. Milliken, Chancellor, The University of Texas System, hosted the 3rd BUILD conversation in Austin on May 14, 2019. This final dialogue brought into focus several potential PPP models, including: an all-of-nation call for large, regionally-based next generation semiconductor research and manufacturing; a PPP to support the development of specialized semiconductor chips to bridge from current “Moore’s Law” chips to the next technological revolution; etc.

Based on the findings and outcomes of the progressive dialogues, the Council will develop a final report synthesizing the dialogues and outlining a set of potential PPP models for recommendation to the NSF and the JPO overseeing the NSCI.



Top: Participants in the BUILD Dialogue 2 outside of the San Diego Supercomputer Center in San Diego, CA.

Bottom: Mr. Chad Evans, Executive Vice President, Council on Competitiveness; Dr. Michael Norman, Director, San Diego Supercomputer Center; Dr. Sandra Brown, Vice Chancellor for Research and Distinguished Professor, University of California, San Diego; Dr. Albert Pisano, Dean, Jacobs School of Engineering, University of California, San Diego; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.



Top: Participants in the BUILD Dialogue 3 outside of the AT&T Conference Center at The University of Texas at Austin in Austin, TX.

Bottom: Mr. Chad Evans, Executive Vice President, Council on Competitiveness; Mr. James B. Milliken, Chancellor, The University of Texas System; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

CALENDAR OF EVENTS

2018

NOVEMBER 7

BUILD for Advanced Computing: Dialogue 1

Hosts: The Honorable Patrick D. Gallagher, Chancellor, University of Pittsburgh; and Dr. Farnam Jahanian, President, Carnegie Mellon University Pittsburgh, PA

2019

MARCH 11

BUILD for Advanced Computing: Dialogue 2

Host: Dr. Pradeep Khosla, Chancellor, University of California, San Diego, in partnership with the San Diego Supercomputer Center San Diego, CA

MAY 14

BUILD for Advanced Computing: Dialogue 3

Host: Mr. James B. Milliken, Chancellor, The University of Texas System Austin, TX



Top left: Dr. Jake Taylor, Assistant Director for Quantum Information Science, White House Office of Science and Technology Policy; and Dr. Melur Ramasubramanian, Vice President for Research, University of Virginia.

Top right: Dr. Manish Parashar, Office Director, Office of Advanced Cyberinfrastructure, National Science Foundation, and Co-Chair, Joint Program Office for Strategic Computing; and Ms. Thuc Hoang, Program Manager, Advanced Simulation and Computing, National Nuclear Security Administration, U.S. Department of Energy.

Center left: Mr. Chad Evans, Executive Vice President, Council on Competitiveness; Mr. Rustom Mody, Senior Fellow, Council on Competitiveness; Dr. Vipin Chaudhary, Program Director, Office of Advanced Cyberinfrastructure, National Science Foundation; and Mr. Jim Brinker, President, Intel Federal LLC.

Center right: Mr. Sridhar Sudarsan, Chief Technology Officer, Spark-Cognition, Inc.

Bottom: Ms. Candace Culhane, Program/Project Director, Los Alamos National Laboratory; Dr. Jeffrey Nichols, Associate Laboratory Director for Computing & Computational Sciences, Oak Ridge National Laboratory; and Dr. Taylor Eighmy, President, The University of Texas at San Antonio.



Top left: Mr. Shawn Strande, Deputy Director, San Diego Supercomputer Center; and Dr. Vipin Chaudhary, Program Director, Office of Advanced Cyberinfrastructure, National Science Foundation.

Top right: Mr. Dan Armbrust, Co-Founder and Director, Silicon Catalyst; Major General Sheila Zuehlke, U.S. Air Force (retired); and Ms. Kathy Trimble, Vice President, Council on Competitiveness.

Center left: Ms. Irene Qualters, Associate Laboratory Director for Simulation and Computation, Los Alamos National Laboratory.

Center right: Dr. Gilroy Vandentop, Director, Corporate University Research, Intel.

Bottom: Dr. Steven Leslie, Executive Vice Chancellor for Academic Affairs, The University of Texas System; and Ms. Julie Goonewardene, Chief Innovation and Human Resources Officer, The University of Texas System.



COMPETE: INNOVATION**Advanced Computing Roundtable**

Advanced computing is essential for industrial innovation, national security and leadership in nearly every scientific discipline.

The Advanced Computing Roundtable (ACR) convenes national leaders from industry, academia and the national laboratories to explore how an ever-evolving advanced computing ecosystem can be kept globally competitive and leveraged for American prosperity.

With global competition at its peak, the strategic importance of advanced computing has never been greater. America must have world-class computing resources, skills, software and application models if it is to lead the revolutions underway in artificial intelligence, big data, the Internet of Things, genomics, materials, additive manufacturing and robotics. At the same time, computing itself is transforming as the race is on to extend Moore's Law, build systems with new architectures for modern challenges and develop quantum computers.

The ACR examines these issues and recommends actions for both policymakers and private sector stakeholders. The initiative builds on more than a decade of Council on Competitiveness (Council) leadership and accomplishment animated by the realization that to out-compete, the United States must out-compute.

Year in Review

The ACR facilitated more in-depth conversations on emerging and current technologies in advanced computing in 2018, hosting four ACR events (two ACR Roundtable Meetings and two Regional Forums) over the course of the year.

In April, the ACR held its first meeting of the year at the Council's offices and reflected the interests of ACR members to have deeper conversations on timely topics with significant potential impact on national competitiveness, such as quantum computing and machine learning. ACR members were joined by quantum computing technology and policy leaders who explored with members the potential for quantum and other advanced computing technologies on the horizon to dramatically change the competitiveness landscape, against a backdrop of diminishing funding for research and commercialization.

The second ACR meeting, also held at the Council's offices, featured conversations on intersections between advanced computing, cybersecurity and

INITIATIVE CO-CHAIRS

The Honorable Patricia Falcone
Deputy Director for Science and Technology
Lawrence Livermore National Laboratory



The Honorable Steven E. Koonin
Director, Center for Urban Science and Progress and Professor of Information, Operations & Management Sciences, Leonard N. Stern School of Business New York University



Dr. J. Michael McQuade
Vice President of Research
Carnegie Mellon University

Advanced Computing Roundtable Events



blockchain, giving participants a sense of current issues and major applications. The conversation also explored how cyber issues or blockchain technology impacted the larger advanced computing environment in terms of hardware requirements, software development, research needs, policy needs, or education and training issues.

The ACR Regional Forums were hosted at the Ohio Supercomputing Center in Columbus, OH, in July 2018 and Oak Ridge National Laboratory in Oak Ridge, TN, in December 2018. These Advanced Computing Forums, designed to engage a broad community of leaders on advanced computing, explored opportunities to enhance local, regional and national competitiveness through supercomputing and encouraged discussion around breaking down barriers to adoption. The themes for each of these Advanced Computing Forums were tightly aligned to the strengths of the hosts, in Ohio spotlighting

KEY 2019 PUBLICATIONS

Released in May 2019 in Washington, D.C., *Explore* summarizes the findings from four regional summits that sought to highlight the role of advanced computing in regional economic development.





the importance of early awareness and skills development to strengthen advanced computing in the United States, and in Oak Ridge delving into possible economic growth potential from partnerships between industry and national laboratories.

2019 represents a new chapter for the ACR, as one long-running grant from the U.S. Department of Energy (DoE) supporting this work comes to a close, represented by the release of *Explore*.

Key findings of this report detail in depth the importance of raising awareness of advanced computing as a resource powering America's productivity engine. The report recommends exposing the next generation of users, scientists and innovators to advanced computing, as well as improving accessibility of advanced computing machines and the resources and skilled proficiency of advanced computing tools.

The advancing and rapidly accelerating influence of advanced computing on national competitiveness demonstrates the importance of this long-standing effort at the Council. In recognition of this program's significance, the ACR will be elevated to a permanent fixture in the Council's CTO-led Technology Leadership & Strategy Initiative (TLSI), and be used as a



cross-sectoral tool underpinning future competitiveness as part of the National Commission on Innovation and Competitiveness Frontiers.

At the core of advanced computing is the physical microelectronics, which is confronted by the limits of Moore's Law and increased competition from other nations. The Council is exploring a new partnership with the DoE that will look to disseminate findings from previous efforts and set an action agenda for the future of the U.S. microelectronics industry.



OPPOSITE PAGE

Top left: Ms. Dona Crawford, Senior Fellow, Council on Competitiveness, and President, Livermore Foundation; Dr. J. Michael McQuade, Vice President of Research, Carnegie Mellon University; the Honorable Patricia Falcone, Deputy Director for Science and Technology, Lawrence Livermore National Laboratory; the Honorable Steven Koonin, Director, Center for Urban Science and Progress (CUSP), New York University, and Distinguished Fellow, Council on Competitiveness; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

Top right: Dr. Brent Stacey, Senior Advisor, Idaho National Laboratory; Dr. Brice Hendrickson, Associate Director for Computation, Lawrence Livermore National Laboratory; Mr. William Bates, Executive Vice President, Council on Competitiveness; and Ms. Dona Crawford, Senior Fellow, Council on Competitiveness, and President, Livermore Foundation.

Bottom: Dr. David Turek, Vice President of HPC Marketing Engagement, IBM.



THIS PAGE

Top: Participants in Advanced Computing for Competitiveness Regional Forum 3 at the Ohio Supercomputing Center.

Center: Mr. Thomas Lange, Principal, Technology Optimization and Management, LLC.

Bottom: Mr. William Bates, Executive Vice President, Council on Competitiveness; Dr. Thomas Zachaira, Director, Oak Ridge National Laboratory; and Dr. Suzanne Lacey, Superintendent of Talladega County Schools.





Top left: Members of the Advanced Computing Roundtable meet at the Council on Competitiveness in Washington, D.C., April 2016.

Top right: Dr. Mike Trutt, Chief Engineer—Algorithmic Warfare Department, Northrop Grumman Mission Systems; and Dr. Gary Mastin, Senior Fellow, Corporate Engineering, Technology & Operations, Lockheed Martin.

Center left: Mr. Chad Evans, Executive Vice President, Council on Competitiveness; and Mr. Vipin Chaudhary, Program Director, National Science Foundation.

Center right: Mr. Bob Sorenson, Vice President of Research and Technology, Hyperion Research; Dr. Rick Stevens, Director for Computing, Environment and Life Sciences, Argonne National Laboratory; and Dr. Fred Streitz, Chief Computational Scientist, Lawrence Livermore National Laboratory.

Bottom left: Mr. Robert Frazier, Development Engineer at Kinney Group, Inc.; and Dr. William Chappell, Special Assistant to the Director, Defense Advanced Research Projects Agency (DARPA).



Top left: Mr. Robert Meisner, Director, Advanced Simulation and Computing, National Nuclear Security Administration; Dr. J. Steve Binkley, Associate Director, Advanced Scientific Computing Research, Office of Science; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness.

Top right: Ms. Debra Goldfarb, Chief Analyst, Intel Fellow, Intel Corporation; and Dr. Rick Stevens, Director for Computing, Environment and Life Sciences, Argonne National Laboratory.

Bottom: Dr. Barry C. Bolding, former Vice President, Marketing and Business Development, Cray Inc.; Mr. David W. Turek, Vice President, Technical Computing OpenPOWER, IBM Systems Group, IBM Corporation; Dr. Mark Seager, Intel Fellow, Chief Technology Officer for the HPC Ecosystem, Intel Corporation; and Mr. Scott Misage, Vice President and General Manager for High Performance Computing, Hewlett-Packard Company.

CALENDAR OF EVENTS

2018

APRIL 11

ACR Roundtable Meeting

Host: Council on Competitiveness
Washington, D.C.

JULY 10

Midwest Regional Forum

Host: Ohio Supercomputing Center
Columbus, OH

OCTOBER 31

ACR Roundtable Meeting

Host: Council on Competitiveness
Washington, D.C.

DECEMBER 6

Southern Regional Forum

Host: Oak Ridge National Laboratory
Oak Ridge, TN

COMPETE: ENERGY AND MANUFACTURING

Energy and Manufacturing Competitiveness Partnership

The EMCP was designed to approach the country's diverse industrial landscape as a network of distinct but interdependent productive sectors, each with its own challenges and opportunities.

Through a series of six sector studies and an additional three dialogues focusing on cybersecurity hosted across the nation by members of the Steering Committee, the EMCP identified the salient questions and challenges facing the energy-manufacturing nexus within key sectors of the U.S. economy. Seeking input from leaders throughout the private sector, academia, the research and scientific community, NGOs and government, each sector study looked at the challenges and opportunities through the Council on Competitiveness' (Council) cross-cutting competitiveness pillars—technology, talent, investment and infrastructure.

INITIATIVE CO-CHAIRS

The Honorable Rebecca M. Blank
Chancellor
University of Wisconsin—Madison



Mr. Christopher Crane
President & CEO
Exelon Corporation



Dr. William H. Goldstein
Director
Lawrence Livermore National Laboratory

Year in Review

In 2018, the EMCP concluded three years of research and analysis on six diverse sector studies representing industries vital to America's competitiveness and economic well-being. These sector studies on water and manufacturing, advanced materials, biosciences, agricultural and consumer water use, energy and aerospace—in addition to a three dialogue series on cybersecurity and over a decade of work in the energy and manufacturing space—informed *Accelerate: Turbocharging the Manufacturing Renaissance in an Era of Energy Abundance*, the final report of the EMCP, and *Secure: Ensuring Resilience and Prosperity in a Digital Economy*.

Accelerate and *Secure* encapsulate the disruptions across the energy and manufacturing sectors and put forth roadmaps for policymakers to follow that will allow the United States to continue to be a leader in the energy and manufacturing sectors, to capture value from new technologies and to prepare its citizens to prosper long term. In the coming months, the Council will work to engage leaders on the Hill, in the administration and across industry, academia and the national laboratories to ensure these agendas influence the policies of key decision makers and positively impact America's productivity and standard of living.

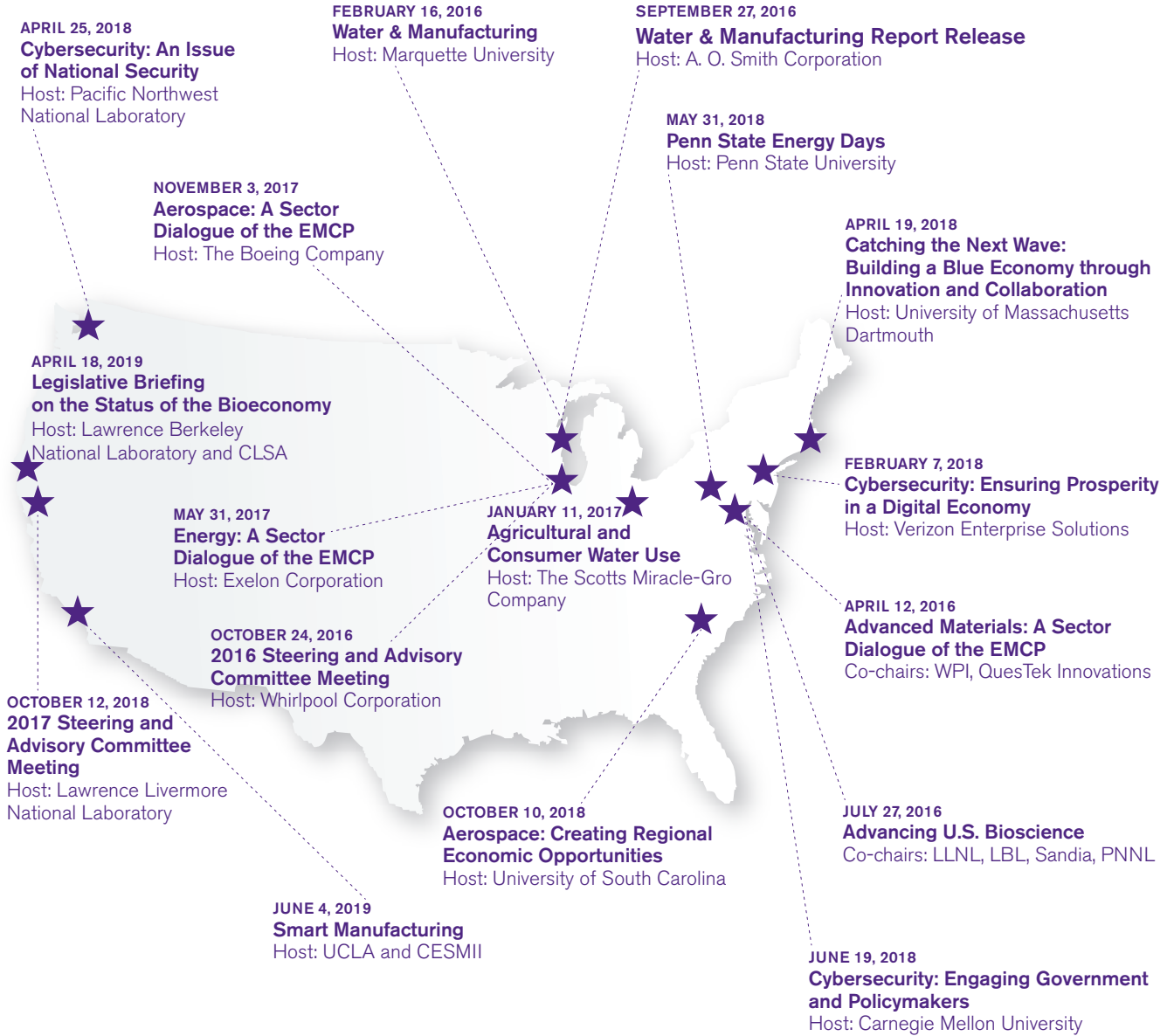


Top: Dr. James Peery, Associate Laboratory Director of Global Security, Oak Ridge National Laboratory; Rep. Gael Tarleton, Washington State Legislature; Dr. Steve Ashby, Director, Pacific Northwest National Laboratory; Ms. Bobbie Stempfley, Director, SEI CERT Division, Carnegie Mellon University; Mr. Mark Estberg, Senior Director, Microsoft; and Dr. Lloyd Wayne Brasure, Director, Defense Programs, Pacific Northwest National Laboratory.

Bottom left: Ms. Martha Delehanty, Senior Vice President, HR Operations, Verizon; Mr. Scott Godwin, Strategic Partnerships and Delegate Initiatives, Pacific Northwest National Laboratory; Dr. Farnam Jahanian, President, Carnegie Mellon University; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Ms. Chandra McMahon, Senior Vice President, Chief Information Security Officer, Verizon; Mr. Michael Mason, Senior Vice President and Chief Security Officer, Verizon; and Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group.

Bottom right: Mr. Jeffery Baumgartner, Senior Advisor, Infrastructure Security and Energy Restoration, U.S. Department of Energy; Mr. Chad Evans, Executive Vice President, Council on Competitiveness; Ms. Heather Scott, Office of Cyber and Infrastructure Analysis, U.S. Department of Homeland Security; and Col. Gent Welsh, Commander, 194th Wing, Washington National Guard.

EMCP Dialogues and Events





As part of the evolution of the EMCP, the Steering Committee found that stakeholders across all sectors of the U.S. economy are increasingly faced with the threat of cyber-attacks that put information, infrastructure and overall security at risk. In 2018, the Council launched a three-dialogue series on the challenges and opportunities related to cybersecurity, co-chaired by Dr. Steven Ashby, Director, Pacific Northwest National Laboratory; Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group; and Dr. Farnam Jahanian, President, Carnegie Mellon University.

The final report, *Secure: Ensuring Resilience & Prosperity in a Digital Economy* is informed by those three dialogues and builds on the work of the EMCP. Secure includes the Council's National Agenda for Cybersecurity, which aims to secure and strengthen America's resilience to the growing cyber threat while ensuring America remains a competitive, productive and prosperous nation.



Top: Mr. Chris Gould, Senior Vice President, Corporate Strategy, and Chief Sustainability Officer, Exelon Corporation; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; the Honorable Mark Wesley Menezes, Under Secretary of Energy, U.S. Department of Energy; the Honorable Rebecca M. Blank, Chancellor, University of Wisconsin–Madison; and Dr. William H. Goldstein, Director Lawrence Livermore National Laboratory.

Center: Dr. Kiran Sheth, Distinguished Engineering Associate, ExxonMobil Research and Engineering; Dr. Jim Davis, Vice Provost IT & Chief Academic Technology Officer, UCLA; Mr. John Dyck, CEO, Clean Energy Smart Manufacturing Innovation Institute; Dr. Gene Block, Chancellor, UCLA; Mr. William Bates, Executive Vice President Council on Competitiveness; and Dr. Steven Ashby, Director, Pacific Northwest National Laboratory.

Bottom: Mr. Chad Evans, Executive Vice President, Council on Competitiveness; Mr. John Chisholm, Chief Executive Officer, John Chisholm Ventures; and Dr. Mark Johnson, Director, Center for Advanced Manufacturing, Clemson University.

On May 31, 2018, the Council released a sector study report focusing on low-cost, efficient energy at Penn State's annual Energy Days conference.

Leverage: Energy is the outcome report of a dialogue hosted in May 2017 by the Council and Mr. Chris Crane, President and CEO, Exelon Corporation, in partnership with Dr. Eric Barron, President, Penn State University, and



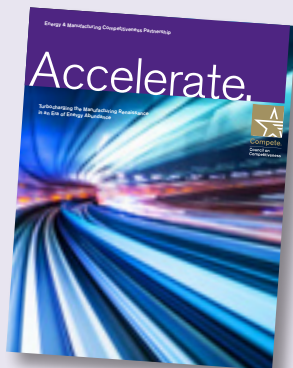
Dr. Paul Kearns, Director, Argonne National Laboratory. The report recommends implementing regulatory policies that encourage preservation, development and implementation of more efficient, clean energy solutions; directing funding toward innovation in energy storage capabilities and clean energy technology; and encouraging multidisciplinary approaches and lifelong learning opportunities.

In October 2018, the Council released **Leverage: Aerospace** at the South Carolina Aerospace Conference and Expo.

The report, informed by a dialogue on competitiveness in the aerospace sector hosted by, Dr. Greg Hyslop, Chief Technology Officer, Boeing, in partnership with Dr. Harris Pastides, President, University of South Carolina, in November 2017, outlines a set of key findings and recommendations that, if implemented, will enable America to maintain its global leadership in this critical sector in the face of increasing global competition.



Consistent with the Council's mission to strengthen U.S. productivity, raise the standard of living for all Americans and expand global markets, its members and staff seek to constantly push the policy envelope, asking what's new on the horizon that holds the potential to either grow or inhibit U.S. prosperity. **Accelerate: Turbocharging the Manufacturing Renaissance in an Era of Energy Abundance**, the final report of the Energy and Manufacturing Competitiveness Partnership (EMCP), captures the disruptions across the energy and manufacturing sectors and puts forth a road map for policymakers to follow that will allow the United States to continue to be a leader in the energy and manufacturing sectors, to capture value from new technologies and to prepare its citizens to prosper long term. The policy underpinnings of this effort will be a critical springboard for the National Commission on Innovation and Competitiveness Frontiers.



On October 15, 2018, prior to a public event on Capitol Hill to release **Accelerate** and **Secure**, members of the EMCP Steering and Advisory Committees met to discuss potential pathways forward for the initiative. The group endorsed a path forward that will focus on applying the findings and recommendations from the sector studies conducted during phases one and two to affect policy change at the federal, state and local levels, and to leverage the opportunities in the energy and manufacturing space.

In the short-term, the Council will continue its work to distribute **Accelerate** and **Secure** to key decisionmakers to share the critical findings and key recommendations with leading policy makers and stakeholders in Washington, D.C., and beyond on

Blue Economy

On April 19, 2018, UMass Dartmouth and the Council on Competitiveness convened a critical dialogue about the future of the SouthCoast of Massachusetts, a region whose history, culture and economy have been defined by the sea for centuries.

Sponsored by the SouthCoast Development Partnership and the Massachusetts Clean Energy Center, *Catching the Next Wave: Building the Blue Economy Through Innovation and Collaboration* brought 100 leaders from industry, government and academia together at UMass Dartmouth to consider a new horizon for the region. From Lieutenant Governor Karyn Polito to Congressmen Bill Keating and Joe Kennedy, from General Dynamics to the MF Foley Fish Company, and from the New England Council to the Mass. Business Roundtable, there was a consensus that the SouthCoast has the DNA to build a job-creating, income-increasing “Blue Economy Corridor” from Rhode Island to the Cape Cod.



Top: The Honorable Karen Polito, 72nd Lieutenant Governor, The Commonwealth of Massachusetts; Dr. Robert Johnson, Chancellor, University of Massachusetts Dartmouth; and Mr. William Bates, Executive Vice President, Council on Competitiveness.

Bottom: Participants in the Blue Economy Summit, hosted by the Council on Competitiveness and the University of Massachusetts Dartmouth.

the future of U.S. energy abundance and its impact on advanced manufacturing and competitiveness. The work of the EMCP will be a critical input to the National Commission on Innovation and Competitiveness Frontiers as it explores the future of work and production in the United States.

In addition to this outreach, using the sector study model, in 2019 the Council will launch goal-oriented, regional competitiveness dialogues around specific technologies and/or industries, designed to lead to actionable policy recommendations and outcomes. Each dialogue will provide a high-touch opportunity

for the nation's leaders to collaborate over a three to four month period; organize a full-day, roundtable dialogue to discuss an issue pertinent to their organization and to U.S. competitiveness; and develop an actionable set of policy recommendations for state and federal decision makers. The first regional competitiveness dialogue was hosted by UCLA and CESMII in Spring 2019 and focused on challenges and opportunities in smart manufacturing.

CALENDAR OF EVENTS

2018

FEBRUARY 7

Cybersecurity for Industry

Host: Mr. George Fischer, Senior Vice President and President, Global Enterprise, Verizon Business Group Basking Ridge, NJ

APRIL 25

Cybersecurity: An Issue of National Security

Host: Dr. Steven Ashby, Director, Pacific Northwest National Laboratory Seattle, WA

MAY 31

Leverage: Energy release at Penn State Energy Days

Host: Dr. Eric Barron, President, Penn State University State College, PA

JUNE 19

Cybersecurity: Engaging Government and Policymakers

Host: Mr. James Clifton, CEO, Gallup, Inc. Washington, D.C.

OCTOBER 10

Leverage: Aerospace release at the South Carolina Aerospace Conference and Expo

Host: Dr. Harris Pastides, President, University of South Carolina Columbia, SC

OCTOBER 15

Turbocharging & Securing the U.S. Manufacturing Renaissance

Host: Council on Competitiveness Washington, D.C.

OCTOBER 15

2018 EMCP Steering and Advisory Committee Meeting

Host: Council on Competitiveness Washington, D.C.

2019

JUNE 4

Smart Manufacturing

Host: Dr. Gene Block, Chancellor, University of California, Los Angeles, and CESMII Los Angeles, CA

COMPETE: GLOBAL**Global Partnerships**

The Council on Competitiveness (Council) recognizes that to compete and prosper nationally, the United States must engage globally—defining, shaping and driving the world’s innovation agenda through bilateral and multilateral partnerships.

As the pace of technological change accelerates and geographic and political borders become more porous, the Council is engaging a set of strategic partners to advance a mutually beneficial, pro-growth agenda.

For nearly two decades—and particularly building off the findings and success of its National Innovation Initiative—the Council has developed and led a global innovation and competitiveness movement: a proactive agenda to solve globally-scaled, grand challenges and to meet profound opportunities at the heart of future productivity and prosperity. These efforts involve our members and thousands of other leaders in deep, bilateral collaborations, as well as multilateral engagements on nearly every continent.

Year in Review

During 2018, the Council continued its long-standing U.S.-Brazil Innovation platform, hosting week-long immersions with two delegations of Brazilian science, technology and innovation leaders at sites across the United States. One delegation toured sites in California in the spring, and another delegation explored innovation hubs in Washington, D.C., New York, NY, and Oak Ridge, TN, in the fall.



Ms. Gianna Sagazio, Director of Innovation, National Confederation of Industry (CNI) & National Superintendent, Euvardi Lodi Institute (IEL); and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

The Council was privileged to host Brazilian science and technology leaders, as well as government leaders, as part of the Innovation Ecosystems Immersion programs showcasing new models of innovation and collaborating on efforts to replicate successful elements of those ecosystems in Brazil, with the goal of accelerating innovation and productivity-enhancing technology partnerships between the Western Hemisphere’s two largest economies.

The Council continues to play a leadership role with the Global Federation of Competitiveness Councils (GFCC) as a founding member and the secretariat of the GFCC. Several Council members—including Lockheed Martin, Arizona State University, Georgetown University, Northeastern University, The Ohio State University, The University of Chicago, The University of North Carolina at Chapel Hill, University of California, San Diego, and Webster University—are now also members of the GFCC, having recognized the tremendous advantage and value of the GFCC in helping build global partnerships and business opportunities.



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Top left: Dr. Paul Kearns, Director, Argonne National Laboratory, addresses the June 2019 Brazilian National Confederation of Industry (CNI) Innovation Summit.

Top right: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness, speaks at the June 2019 Brazilian National Confederation of Industry (CNI) Innovation Summit.

Center left: Council Executive Committee member, Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell, plc, speaks at the opening plenary session of the 2018 STS Forum in Kyoto, Japan.

Center right: Participants in the U.S.-Brazil Innovation Platform Immersion.

Bottom: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness, speaks at the Horasis Global Meeting in Cascais, Portugal, in April 2019.

OPPOSITE PAGE

Participants in the 2018 GFCC Annual Meeting.



In September 2018, the Council led a delegation of leaders to the GFCC Global Innovation Summit hosted by EXCELENCIA (FUNDECE/IPACE/FPNC) in Buenos Aires, Argentina. The event brought together leaders and thinkers representing businesses, academia and governments from across the globe to analyze the challenges and opportunities presented by technology transformation and ways of “Scaling-up Sustainable and Innovative Businesses.”

In addition to the Global Innovation Summit, the GFCC global network of members convened for two exclusive conversations: the GFCC Annual Meeting on September 17 and the Meeting of the University and Research Leadership Forum on September 19.

The GFCC Annual Meeting brought together GFCC members and fellows to review their agendas and discuss GFCC initiatives. The 2018 event was organized in two different segments. In the first segment, participants developed a common understanding on their agendas and current GFCC initiatives. A second segment on the “Global Competitiveness Agenda” focused on the exchange of best practices for accelerating competitiveness and included content-rich conversations on innovation and productive transformation, reviewing experiences working within the GFCC global network. Presenters in the meeting included leaders from organizations such as Piraeus Bank, Purdue University, Western Economic Diversification Canada, Athens Exchange Group, Queen Mary University of London and the University of Pittsburgh.

The GFCC University and Research Leadership Forum launched reports from its two task forces, *Optimizing Innovation Alliances* and *Leveraging Extreme Innovation*—the result of two years worth of work by the GFCC. These task forces explored university-industry partnerships, how to foster entre-

preneurship, new and emerging models for collaboration, big/transformational projects, new models for intellectual property management and engagement with society.

In October 2018, the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Chad Evans, Executive Vice President, Council on Competitiveness, traveled to Japan to speak and participate at the 2018 STS Forum. The STS Forum provides a unique opportunity for Council leadership to engage other international science and innovation leaders, providing a backdrop against which the Council can strategically engage global leaders to advance bi- and multi-lateral deals to ultimately enhance U.S. competitiveness and prosperity.

Council Executive Committee member and former Chairman, Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell, plc, spoke on the opening plenary of the 2018 STS Forum. Ms. Wince-Smith spoke in a round-table discussion on Science and Technology in Developing Countries. Representing Lockheed Martin, Dr. Robie Samanta-Roy, Vice President, Technology, spoke on new transportation systems. Other Council members including: Dr. William H. Goldstein, Director, Lawrence Livermore National Laboratory; Dr. Michael Witherell, Director, Lawrence Berkeley National Laboratory; and Dr. Thomas Zacharia, Oak Ridge National Laboratory, also participated in the discussions at the 2018 STS Forum.

The Council's Technology Leadership and Strategy Initiative (TLSI) embarked on a new, joint effort with Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) to bring together Chief Technology Officers from each nation's premier institutions in search of new collaborations to catalyze innovation. This effort was established by a Letter of



The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc, and Chairman, Global Federation of Competitiveness Councils.



Dr. Roberto Alvarez, Executive Director, Global Federation of Competitiveness Councils; and Mr. Santiago Murtagh, President, EXCELENCIA, and Chief Executive Officer, Culligan Water Argentina.

Intent signed on December 6, 2017, by Ms. Wince-Smith and the Honorable Craig Laundy, MP, Assistant Minister for Industry, Innovation and Science, Government of Australia, at a ceremony at Parliament House in Canberra, Australia. The Letter—since updated to include Australia’s Minister for Health, Greg Hunt, MP, and Minister of Innovation and Jobs, Michaela Cash, MP—aims to support efforts to strengthen business and research links between the two nations.

The Letter of Intent established a U.S.-Australian Chief Technology Officer Dialogue. The dialogue will build on the activities of the Council under its TLSI, which draws on 50+ chief technology officers from America’s premier companies, vice presidents of research at leading research institutions and deputy directors of America’s national laboratories to make the business case for strategic, prioritized investments in the research, talent and infrastructure necessary for tech-based innovation.

The launch U.S.-Australia CTO Dialogue was held in Australia in March 2019. Technology and innovation leaders from the United States and Australia had the opportunity to engage in peer-to-peer conversation and share common challenges and opportunities in the innovation and technology space.

Additionally, in February 2019 at the IV Delphi Economic Forum, in Delphi, Greece, Ms. Wince-Smith spoke on a panel providing advice on how to improve the Greek Economy.

And in April 2019, at the Horasis Global Meeting in Cascais, Portugal, Ms. Wince-Smith spoke on the critical need for a roadmap for economic, political and social transition—and what will it take to jointly inspire the future.

Building on past successes of the Council’s U.S.-Brazil Innovation platform—focusing on identifying bilateral partnerships to advance innovation, including past innovation immersion programs and joint innovation summits—the Council, in June 2019, supported the Brazilian National Confederation of Industry (CNI) Innovation Summit by creating opportunities for Council members to speak and engage with Brazil’s private sector leadership.

Later in 2019, the Council will once again lead a high-level delegation to the GFCC Global Innovation Summit and participate in the STS Forum in Kyoto, Japan.



Top: Members of the GFCC at the Launch of the 2018 Edition of the Global Competitiveness Principles and Best Practices.

Center left: Dr. George Handjinicolaou, Chairman of the Board, Piraeus Bank; and Dr. Eiman Al-Mutairi, Advisor to Minister of Commerce and Investment, Kingdom of Saudi Arabia.

Center right: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Santiago Murtagh, President, EXCELENCIA, and Chief Executive Officer, Culligan Water Argentina.

Bottom: Mr. Chad Evans, Executive Vice President, Council on Competitiveness.



CALENDAR OF EVENTS

2018

FEBRUARY 5-9

U.S.-Brazil Immersion

San Diego and Bay Area, CA

AUGUST 13-17

U.S.-Brazil Immersion

Washington, D.C.; New York, NY; Oak Ridge, TN

SEPTEMBER 17-19

Global Innovation Summit

Buenos Aires, Argentina

OCTOBER 7-10

STS Forum

Kyoto, Japan

2019

MARCH 25-28

U.S.-Australia CTO Dialogue

Host: Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Sydney-Melbourne and Canberra, Australia

JUNE 2019

Innovation Summit

Host: IEL CNI

Sao Paulo, Brazil

SEPTEMBER 16-19

Global Innovation Summit

Nur-Sultan, Kazakhstan

OCTOBER 6-10

STS Forum

Kyoto, Japan



Top: Dr. Jorge Guimarães, Chief Executive Officer, Brazilian Agency for Industrial Research and Innovation (EMBRAPPI); Ir. Dr. Aidid Chee Tahir, Chief Strategy Officer, Universiti Teknologi Petronas; and Dr. Matthew Johnson, Partnerships Manager, King's College London.

Bottom: Prof. Isabel Capelo Gil, Rector, Catholic University of Portugal, and President, International Federation of Catholic Universities; and Prof. Sethuraman "Panch" Panchanathan, Executive Vice President, Knowledge Enterprise; and Chief Research and Innovation Officer, Arizona State University.

COMPETE: LEADERSHIP

Network of Global Leaders



Top left: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness, participates in the IV Delphi Economic Forum in Delphi, Greece.

Top right: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness, participates in the the 2018 STS Forum in Kyoto, Japan.

Center left: Dr. Robie Samanta-Roy, Vice President, Technology, Lockheed Martin, participates in the 2018 STS Forum in Kyoto in a discussion on new transportation systems.

Center right: Dr. William H. Goldstein, Director, Lawrence Livermore National Laboratory, speaking at the 2018 STS Forum.

Bottom: Dr. Thomas Zacharia, Director, Oak Ridge National Laboratory, speaking at the 2018 STS Forum.



Top: Dr. Klaus Hoehn, Senior Advisor, Innovation and Technology, Office of the Chairman, Deere & Company; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Mr. Rustom Mody, Senior Fellow, Council on Competitiveness; the Honorable Patricia Falcone, Deputy Director for Science and Technology, Lawrence Livermore National Laboratory; and Dr. Keoki Jackson, Vice President and Chief Technology Officer, Lockheed Martin.

Mr. Chad Evans, Executive Vice President, Council on Competitiveness; Dr. Klaus Hoehn, Senior Advisor, Innovation and Technology, Office of the Chairman, Deere & Company; and the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness.

Bottom: Dr. Michael Witherell, Director of Lawrence Berkeley National Laboratory, speaking at the 2018 STS Forum.



Top left: Mr. Mark Minevich, Principal Founder, Going Global Ventures, and Senior Fellow, Council on Competitiveness, speaks at the June 2019 Brazilian National Confederation of Industry (CNI) Innovation Summit.

Top right: Mr. Greg Morin, Director, Office of Strategy, Performance, and Risk, Argonne National Laboratory; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Mr. Chad Evans, Executive Vice President, Council on Competitiveness; and Dr. Paul Kearns, Director, Argonne National Laboratory at the June 2019 Brazilian National Confederation of Industry (CNI) Innovation Summit.



Center: Dr. Michiharu Nakamura, Counsellor to the President, Japan Science and Technology Agency (JST), and Distinguished Fellow, Global Federation of Competitiveness Councils; Ms. Adriana Kuiper, Director, Arizona State University Enterprise Development; Mr. Sokrotis Lazaritis, Chief Executive Officer, Athens Stock Exchange; and Ir. Dr. Aidid Chee Tahir, Chief Strategy Officer, Universiti Teknologi Petronas.



Bottom: Prof. Isabel Capelo Gil, Rector, Catholic University of Portugal.



Top: Participants in the 2018 Global Innovation Summit.



Bottom: Prof. Peter Smith, Pro Vice Chancellor International, University of Southampton; Mr. Zakwan Zabidi, Senior Vice-President, Malaysian Industry-Government Group for High-Technology (MIGHT); and Ms. Rebecca O. Bagley, Former Vice Chancellor for Economic Partnerships, University of Pittsburgh.



Top: Dr. Ayedh Al-Otaibi, Deputy Governor, Saudi Arabian General Investment Authority.

Bottom: Dr. Sharifa Al Harthy, Director, Oman National Innovation Strategy.

Top: Mr. Álvaro Maldonado, Secretary of Productive Development and Competitiveness, Metropolitan District of Quito, Ecuador; the Honorable Jerry M. Hultin, Chief Executive Officer, Global Futures Group, and Distinguished Fellow, Global Federation of Competitiveness Councils; Dr. Eiman Al-Mutairi, Advisor to the Minister of Commerce and Investment, Kingdom of Saudi Arabia; Mr. Bader Shaikhan Al Abdali, Acting Director, National Competitiveness Office Oman; Dr. Nkem Khumbah, Chair, Africa Development Futures Group; and Senior Fellow, Global Federation of Competitiveness Councils.

Bottom: Dr. George Handjinicolau, Chairman of the Board, Piraeus Bank.



Top: Participants in the Global Innovation Summit along with Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc, and Chairman, Global Federation of Competitiveness Councils; Mr. Chad Evans, Executive Vice President, Council on Competitiveness; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Dr. Roberto Alvarez, Executive Director, Global Federation of Competitiveness Councils; Ms. Yasmin Hilpert, Senior Director of Policy & Engagement, Global Federation of Competitiveness Councils; Mr. Jorge Ferreiro, Director of Innovation, EXCELENCIA; and Mr. Santiago Murtagh, President, EXCELENCIA, and Chief Executive Officer, Culligan Water Argentina.

Center left: Mr. Santiago Murtagh, President, EXCELENCIA, and Chief Executive Officer, Culligan Water Argentina; Ms. Veronica Verano, Actress; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc, and Chairman, Global Federation of Competitiveness Councils.

Center right: Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc, and Chairman, Global Federation of Competitiveness Councils.

Bottom: Dancers perform at the Global Innovation Summit Dinner.



Top: Mr. Jorge Ferreiro, Director of Innovation, EXCELENCIA; Mr. Santiago Murtagh, President, EXCELENCIA, and Chief Executive Officer, Culligan Water Argentina; H.E. Sergio Bergman, Secretary of Environment and Sustainable Development, Government of Argentina; the Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; Mr. Charles O. Holliday, Jr., Chairman, Royal Dutch Shell plc, and Chairman, Global Federation of Competitiveness Councils; H.E. Jorge Aguado, Secretary of Planning and Policy of Science, Technology and Productive Innovation, Argentina.

Center left: The Honorable Deborah L. Wince-Smith, President & CEO, Council on Competitiveness; and Mr. Santiago Murtagh, President, EXCELENCIA, and Chief Executive Officer, Culligan Water Argentina.

Center right: Dr. Frank-Jürgen Richter, Chairman, Horasis, and Distinguished Fellow, Global Federation of Competitiveness Councils; Ms. Nadja Richter; Prof. Isabel Capelo Gil, Rector, Catholic University of Portugal, and President, International Federation of Catholic Universities; and Dr. Nkem Khumbah, Chair, Africa Development Futures Group, and Senior Fellow, Global Federation of Competitiveness Councils.

Bottom: Ms. Yasmin Hilpert, Senior Director of Policy & Engagement, Global Federation of Competitiveness Councils; and Mrs. Santiago Murtagh.



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Top: Participants at the Global Innovation Summit Dinner.

Bottom: Dr. Sethuraman "Panch" Panchanathan, Executive Vice President, Knowledge Enterprise, and Chief Research and Innovation Officer, Arizona State University.

OPPOSITE PAGE

Top: Participants at the Global Innovation Summit Dinner.

Center left: Dr. Roberto Alvarez, Executive Director, Global Federation of Competitiveness Councils.

Center right: Mr. Santiago Murtagh, President, EXCELENCIA, and Chief Executive Officer, Culligan Water Argentina.

Bottom left: Mr. Charles Kiefel OAM, Co-Chair, Australian Advisory Board on Technology and Health Competitiveness, Chairman, Principals Funds Pty Ltd., and Distinguished Fellow, Global Federation of Competitiveness Councils.

Bottom right: Mr. John Chisholm, Chief Executive Officer, John Chisholm Ventures; and Dr. Nkem Khumbah, Chair, Africa Development Futures Group, and Senior Fellow, Global Federation of Competitiveness Councils.



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.

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