

The National Academies of
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Sustainable and Resilient Supply Chains with Emerging Technologies: Workshop Series
February 2021

Overview: The workshop series will address opportunities, challenges, and environmental implications of increasing local inclusion and community participation in global value chain networks by using new technologies to strengthen resilience and sustainability in the face of recurring disruptions (e.g., natural disasters, disease outbreaks, demand/supply shifts). The discussions will explore the feasibility of introducing advanced manufacturing, logistics and decision-making under alternative supply chain scenarios in different sectors, with a view of strengthening the resilience of communities and adopting far more environmentally and economically sustainable consumption and production approaches in support of the United Nations Sustainable Development Goals.

Workshop I: State of Global Value Chains and Supply Chains 4.0.
Wednesday, February 3, 2021
(all times are U.S. Eastern Time)

This first workshop will focus on the overall picture and recent trends of global value chains; examples from three or four sectors; and the role of technology, data, infrastructure, and logistics for fostering sustainable and resilient supply chains.

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| 12:00 pm | Welcome and Goals for the Workshop Series
Klaus Tilmes (Chair), Senior Policy Adviser and Economic Development Consultant
Franklin Carrero-Martinez, National Academies of Sciences, Engineering, and Medicine |
| 12:10 pm | Framing Remarks: The State of Play and Global Value Chain Governance Models
Anabel González, Peterson Institute for International Economics |
| 12:40 pm | Panel: Sectoral Perspectives on Global Value Chains and Supply Chains
Moderator: Sarah Thorn, Walmart <ul style="list-style-type: none">• Nate Mook, World Central Kitchen (Organizing a Disaster Response to Hurricane Maria, Puerto Rico and its aftermath)• Anne Strauss-Wieder, North Jersey Transportation Planning Authority (Addressing COVID-19 Supply Chain Challenges)• David Stieren, National Institute of Standards and Technology (Strengthening Critical Manufacturing Capabilities)• Gerald E. Galloway (NAE), University of Maryland (Impact of Disasters on Supply Chain Resilience) |
| 1:45 pm | Policy Choices, Implementation Requirements, and Questions for Future Research |
| 1:55 pm | Summary Remarks
Klaus Tilmes (Chair), Senior Policy Adviser and Economic Development Consultant |
| 2:00 pm | Adjourn |

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Sustainable and Resilient Supply Chains with Emerging Technologies

Workshop I: State of Global Value Chains and Supply Chains 4.0.
Wednesday, February 3, 2021

Moderator and Speaker Biographical Information

KLAUS TILMES (Planning Committee Chair) is a Senior Policy Adviser and Economic Development Consultant who most recently worked with the Office of the World Bank President to develop the institution's strategy on emerging technologies and scaling adoption through financial assistance, policy advice, and partnerships. He also works closely with the African Center for Economic Transformation and the United Nations Science Technology and Innovation (STI) Forum. Previously, Mr. Tilmes served as Director of the Trade and Competitiveness Global Practice at the World Bank, overseeing operations in Sub-Saharan Africa and the Middle East and global teams on Trade and Competition Policy and Innovation and Entrepreneurship. During his 30-year career at the World Bank, Mr. Tilmes held positions as Director of Strategy and Operations in the Financial and Private Sector Development Network; Knowledge Strategy Advisor; Manager at the Independent Evaluation Group; and Advisor, Corporate Strategy Group. He holds a Master's degree in Public Administration from Harvard University and a Master's in Economics from the University of Mannheim.

FRANKLIN CARRERO-MARTINEZ (Staff) joined the National Academies of Sciences, Engineering, and Medicine in 2018 where he directs the Global Sustainability and Development and the Science and Technology for Sustainability program within the division of Policy and Global Affairs. Prior to this appointment, he was the Acting Deputy Science and Technology Adviser to the Secretary of State. Dr. Carrero-Martínez holds a B.S. in biology, with honors from the University of Puerto Rico (UPR), a Ph.D. in cell and developmental neurobiology, and a certificate in business administration from the University of Illinois at Urbana-Champaign. Previously, Dr. Carrero-Martínez held appointments as associate professor at the UPR, Mayagüez, Adjunct Professor at the UPR Medical Science Campus, and as visiting scholar at Duke University, Massachusetts Institute of Technology, and Japan's Institute of Genetics. Dr. Carrero-Martínez started his career in science diplomacy and policy as the American Association for the Advancement of Science's Roger Revelle Fellow in Global Stewardship. He served this prestigious fellowship with a joint appointment between the Office of the Science and Technology Adviser to the Secretary of State (STAS) and the National Academy of Sciences. At the end of his fellowship, he served as program director at the National Science Foundation supporting the foundation's diplomatic and representational obligations, while managing a portfolio of international basic science collaboration grants before returning to STAS in 2016. In this role he provided senior officials with analysis, guidance, recommendations and strategic planning to anticipate the foreign policy impacts of emerging STI issues, built STI capacity within the Department, and engaged the National Security Innovation Base to promote Department priorities.

GERALD E. GALLOWAY (NAE) is a Glenn L. Martin Institute Professor of Engineering, Department of Civil and Environmental Engineering, University of Maryland, where his focus is on disaster resilience and mitigation, sustainable infrastructure development, and water resources and energy policy and management under climate change. He joined the faculty of the University of Maryland following a 38-year career in the U.S. Army, retiring as Brigadier General, and serving eight additional years in the federal government, most of which was associated with water resources management. He served for three years as District Engineer for the Army Corps in Vicksburg, MS and later, for seven years as a Presidential appointee to the Mississippi River Commission. Dr. Galloway is the former Dean of the

faculty and academic programs at the Industrial College of the Armed Forces, and former Dean of the academic board, United States Military Academy at West Point. In 1993 and 1994 he was assigned to the White House to lead an interagency study of the causes of the Great Mississippi River Flood of 1993 and to make recommendations concerning the nation's floodplain management program. In 2008, the Governor of Louisiana appointed him to his Advisory Commission on Coastal Protection, Restoration and Conservation where he served until 2018 and in 2014 the Governor of Maryland appointed him to the State Coast Smart Council. In 2014, he was appointed chair of an international panel of experts to examine the flooding threats to Florence, Italy and its art treasures and by the government of Singapore to a panel of experts advising on sea level rise challenges faced by that country. He is an elected member of the National Academy of Engineering, the National Academy of Public Administration and National Academy of Construction. He holds a master's degree in Engineering from Princeton; a Master's in Public Administration from Penn State (Capitol Campus), a Master's in Military Art and Science from the US Army Command and General Staff College and a Ph.D. in Geography (Water Resources) from the University of North Carolina (Chapel Hill).

ANABEL GONZÁLEZ has been nonresident senior fellow for the Peterson Institute for International Economics since October 2018. Ms. González is host of the Institute's Trade Winds virtual event series. She was senior director of the World Bank's Trade and Competitiveness Global Practice (2014–18), where she led the Bank's agenda on trade, investment climate, competitiveness, innovation, and entrepreneurship. She previously served as minister of trade of Costa Rica (2010–14), where she headed the strategy to join the Organization for Economic Cooperation and Development, negotiated and implemented six free trade agreements, and contributed to attract over 140 foreign direct investment projects. She also had a lead role in Costa Rica's Competitiveness and Innovation Council and was president of the Export Promotion Board. In her more than 15 years of service at the Ministry of Foreign Trade, she held several positions, including ambassador and chief negotiator of the free trade agreement between Central America and the United States (2003–04). She has also worked as director of the Agriculture Division of the World Trade Organization (2006–09); senior consultant on trade and investment, Inter-American Development Bank (2009–10); and director-general, Costa Rican Investment Promotion Agency (2001–02). She is a member of the World Economic Forum Global Future Council on Trade and Investment and has written extensively on trade and investment and presented in over 50 countries around the world. She holds a master's degree in international trade law and policy from Georgetown University and a law degree from the University of Costa Rica.

NATE MOOK is the Chief Executive Officer (CEO) of World Central Kitchen. Mr. Mook began his career as a tech entrepreneur and later worked as documentary producer, leading film productions around the world for the United Nations, U.S. Agency for International Development, and World Bank. He produced the film *Baltimore Rising* for HBO. Mr. Mook previously developed and spearheaded TEDx events in numerous countries, and was selected as a Gates Foundation "Change Hero" for his work with TEDx elevating voices in underserved communities. Mr. Mook began working with José Andrés and World Central Kitchen in 2012, and together they produced a PBS/National Geographic documentary on Haiti in 2015. Mr. Mook led World Central Kitchen's food relief efforts in Puerto Rico after Hurricane Maria in September 2017, ultimately becoming CEO in early 2018. Since then, Mr. Mook has led the organization's dramatic growth and strategic shift to its current work using food as a solution to humanitarian crises around the world.

DAVID STIEREN is the Division Chief for Extension Services at National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP). Mr. Stieren is a mechanical engineer who has been at NIST MEP since 2007. Prior to joining NIST MEP, he served for approximately 20 years in the NIST Laboratories as a research engineer, project manager, and program manager. Mr. Stieren has experience working with the manufacturing technologies, processes, systems, and supply chains operating in many industries of the U.S. manufacturing sector. Mr. Stieren's professional experience has included

details on the staff of the NIST Director and the staff of the Office of the Secretary of Defense in the Pentagon, as well as details at both the U.S. Department of Energy and the U.S. Small Business Administration. Mr. Stieren served for over 5 years as the NIST MEP principal for a broad partnership with the U.S. Department of Transportation that leveraged the MEP National Network to improve and increase U.S. manufacturer participation in U.S. transportation-related supply chains. He has also served as Executive Secretary of the National Science and Technology Council's Interagency Working Group on Manufacturing R&D, and he represents NIST MEP in ongoing interagency initiatives focused on U.S. manufacturing supply chains. Mr. Stieren was educated during the 1980s and 1990s at the U.S. Naval Academy, Catholic University of America, University of Maryland, and George Washington University, and he holds degrees in Mechanical Engineering and Technology/Engineering Management. Additionally, Mr. Stieren was as an Adjunct Professor in the George Washington University School of Engineering and Applied Sciences in the 1990s.

ANNE STRAUSS-WIEDER is a nationally respected senior executive and expert in freight and logistics. She currently serves as the Director of Freight Planning at the North Jersey Transportation Planning Authority (NJTPA) and has over 40 years of private and public sector experience. Ms. Strauss-Wieder is in leadership roles in national advisory committees and professional organizations including appointments to the U.S. Department of Commerce's Advisory Committee on Supply Chain Competitiveness (where she chairs the Workforce Subcommittee) and the U.S. Maritime Administration's Marine Transportation System National Advisory Committee (where she co-chairs the Port Working Group). She also chairs the Transportation Research Board's Committee on the Logistics of Disaster Response and Business Continuity and is an emeritus member of the Freight Transportation Logistics and Planning Committee. She developed and teaches a graduate course on Freight and Public Policy at the Rutgers University Bloustein School. Ms. Strauss-Wieder has a B.A. and M.A. in Regional Science from the University of Pennsylvania and was a 2010 Lead New Jersey Fellow.

SARAH THORN (Planning Committee Member) is Senior Director of Global Government Affairs at Walmart, primarily responsible for managing global government relations related to supply chain and trade issues. In this capacity, she advocates for Walmart priorities in legislation and trade negotiations that impact the company's worldwide sourcing, e-commerce and retail distribution rights. She also leads a team that drives global public policy in support of Walmart's responsible sourcing commitments. Most recently, Ms. Thorn has expanded her portfolio to manage Walmart's UK government relations, focused on BREXIT negotiations. Before joining Walmart, Ms. Thorn worked for seven years at the Grocery Manufacturers Association where she led the food, beverage and consumer products industry advocacy on international trade issues. She has also worked as a consultant for PricewaterhouseCoopers on business mobility issues and served as an international relations representative with AMP Incorporated. She holds a Master of Arts degree in law and diplomacy from the Fletcher School of Law and Diplomacy at Tufts University and a Bachelor of Arts degree in comparative area studies and comparative literature cum laude from Duke University. She serves as co-chair of the board of the U.S. Global Leadership Coalition and Secretary of the Board of the Washington International Trade Association.

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Fostering Sustainable and Resilient Supply Chains with Emerging Technologies: A Virtual Workshop Series

Statement of Task

An expert committee of the National Academies of Sciences, Engineering, and Medicine will organize and conduct a series of virtual public workshops on fostering sustainable and resilient supply chains with emerging technologies. The workshops will convene experts from local government, the private sector, the philanthropic community, academia, and nongovernmental organizations to address the advantages, disadvantages, and environmental implications of moving toward localized production, which may be less vulnerable to some types of natural disasters and disease outbreaks. Workshop participants will also discuss and share their perspectives on the feasibility of and need for underlying supply chain elements required to implement a scalable model for additive and advanced manufacturing taking into consideration various scenarios. Discussions will include those relevant to the United Nations Sustainable Development Goals related to creating greater resilience for communities and far more environmentally and economically sustainable consumption and production approaches. A Proceedings of a Workshop—in Brief will be prepared by a designated rapporteur in accordance with institutional guidelines.

Audiences and Impact

The intended audiences for this workshop series include Congress, governments, academia, private and nonprofit sectors, and the philanthropic community interested in addressing issues of supply chain sustainability and resilience. The workshops are expected to better inform these various sectors on the complex issue of supply chain sustainability, help identify potential research needs and possible strategies related to harnessing emerging technologies for sustainable and resilient supply chains, and build connections among participants from local government, the private sector, and nongovernmental organizations.

Work Plan

An expert committee will develop the agenda for the virtual workshop series, select presenters and discussants, and moderate the discussions. A rapporteur-authored workshop proceedings in brief will be produced in accordance with institutional procedures. The proceedings will be subject to an appropriate review procedure prior to release and will be distributed widely to the sustainability community.

Committee Membership Information

Klaus Tilmes (Chair), Senior Policy Adviser and Economic Development Consultant

Banning Garrett, Faculty of Global Policy and Development, Singularity University

Patricia Gruber, Independent Consultant

Paul Pisano, Independent Consultant for Transportation Operations

Catherine Ross, Regents' Professor and Harry West Chair, School of City and Regional Planning and Civil and Environmental Engineering, Georgia Institute of Technology

Sarah Thorn, Senior Director of Global Government Affairs, Walmart

National Academies Staff

Franklin Carrero-Martínez, Senior Director, Global Sustainability and Development & Science and Technology for Sustainability Program

William Anderson, Senior Program Officer, Transportation Research Board

Laurie Geller, Study Director, Board on Atmospheric Sciences and Climate

Steven Stichter, Director, Resilient America Program

Emi Kameyama, Program Officer, Science and Technology for Sustainability Program