

# Network of Global Future Councils 2016-2018

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May 2019



# Network of Global Future Councils 2016-2018

The World Economic Forum's [Network of Global Future Councils](#) is the world's foremost interdisciplinary knowledge network dedicated to promoting innovative thinking on the future. The network convenes more than 700 of the most relevant and knowledgeable thought leaders.

The 2016-2018 term convened experts from academia, government, business and civil society to challenge

conventional thinking and develop new insights and perspectives on the key global systems, as well as the impact and governance of emerging technologies.

This report provides an overview of the 34 Global Future Councils in the 2016-2018 term, including council mandates and objectives, achievements and the list of members.



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# Contents

The Future of Advanced Materials	4	The Future of Production	58
The Future of Artificial Intelligence	6	The Future of Space Technologies	60
The Future of Biotechnologies	8	The Future of Technology, Values and Policy	62
The Future of Blockchain	10	The Future of the Humanitarian System	64
The Future of Cities and Urbanization	12	The Future of Behavioural Sciences	66
The Future of Computing	14	The Future of Platforms and Systems	68
The Future of Consumption	16	The Future of Regional Governance	70
The Future of Cybersecurity	18		
The Future of Digital Economy and Society	20		
The Future of Economic Progress	22		
The Future of Education, Gender and Work	24		
The Future of Energy	26		
The Future of Environment and Natural Resource Security	28		
The Future of Financial and Monetary Systems	30		
The Future of Food Security and Agriculture	32		
The Future of Health and Healthcare	34		
The Future of Human Enhancement	36		
The Future of Human Rights	38		
The Future of Information and Entertainment	40		
The Future of Innovation and Entrepreneurship	42		
The Future of International Governance Public-Private Cooperation and Sustainable Development	44		
The Future of International Security	46		
The Future of International Trade and Investment	48		
The Future of Long-Term Investing, Infrastructure and Development	50		
The Future of Migration	52		
The Future of Mobility	54		
The Future of Neurotechnologies and Brain Science	56		

# The Future of Advanced Materials

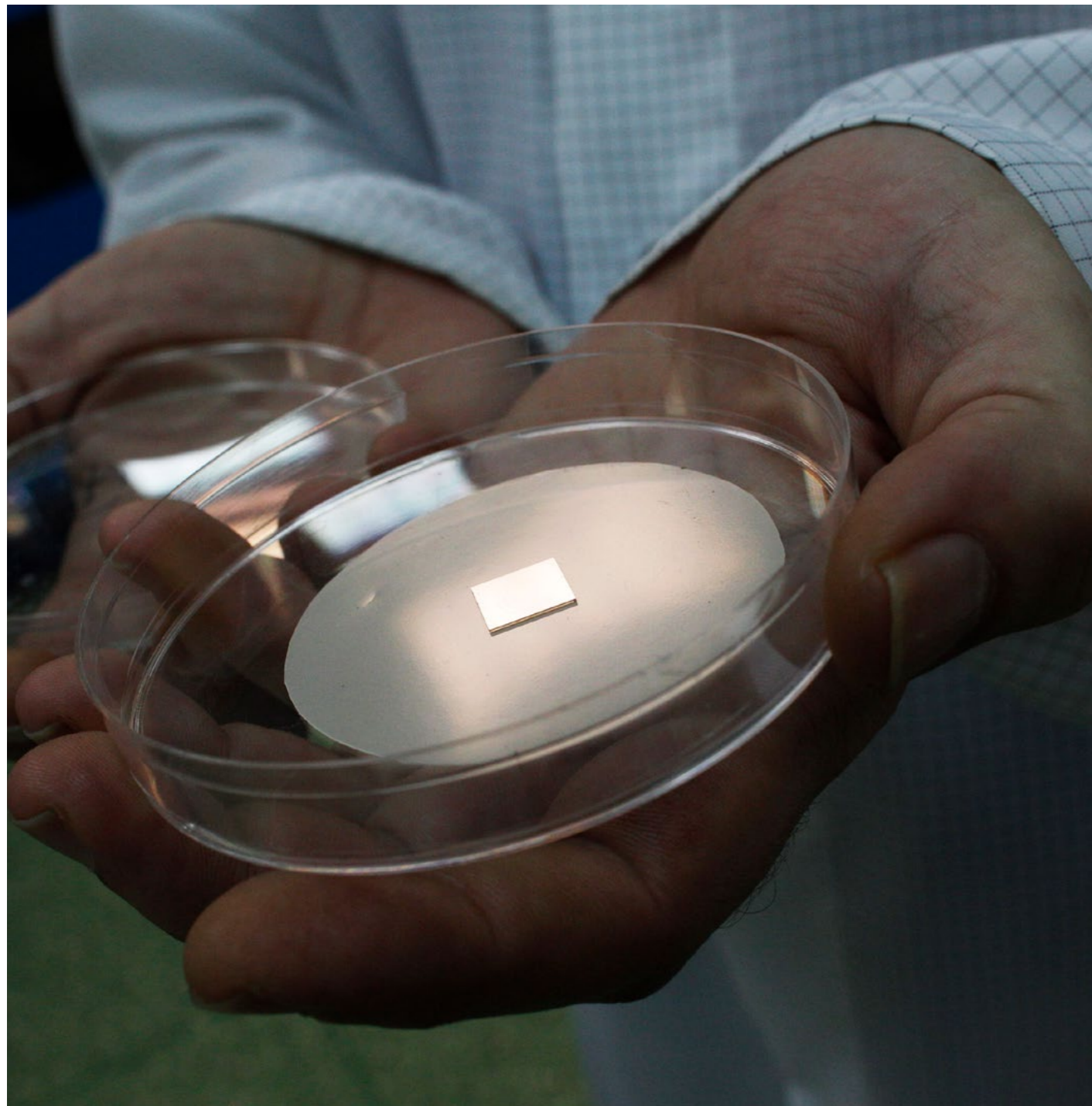
## Mandate and objectives:

Explore how developments in advanced materials could impact industry, governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are kept under control.

## Council outputs:

- A set of principles for the design, development and use of advanced materials, taking into account environmental, social and ethical considerations

- Article in Nature Materials on “The materials science imperative in meeting the Sustainable Development Goals”, published by Saleem Ali
- Podcast on [Advanced Materials](#) with Bernard Meyerson, Chief Innovation Officer, IBM Corporation, created as part of the World Economic Forum’s [A Glimpse into the Future](#) podcast series



## Council Members

### Co-Chairs:

**Privahini Bradoo,**  
Co-Founder and Chief Executive Officer,  
BlueOak Resources Inc., USA

**Bernard Meyerson,**  
Chief Innovation Officer, IBM Corporation, USA

### Members:

**Rigoberto Advincula,**  
Professor of Macromolecular Science and Engineering,  
Case Western Reserve University, USA

**Saleem Ali,**  
Distinguished Professor of Energy and the Environment,  
University of Delaware, USA

**Alán Aspuru-Guzik,**  
Professor of Chemistry and Chemical Biology,  
Harvard University, USA

**Debashish Bhattacharjee,**  
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**Jeffrey Carbeck,**  
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DC Innovations, Deloitte, United Kingdom

**Mohammad Choucair,**  
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**Bashir Dabbousi,**  
Manager, Technology Strategy and Planning Department,  
Saudi Aramco, Saudi Arabia

**Erica Fuchs,**  
Professor of Engineering and Public Policy,  
Carnegie Mellon University, USA

**Julia Greer,**  
Professor, Materials Science, Mechanics and Medical  
Engineering, California Institute of Technology (Caltech),  
USA

**Heide Hackmann,**  
Executive Director, The International Council for Science  
(ICSU), France

**Thom Mason,**  
Senior Vice President for Laboratory Operation,  
Battelle Memorial Institute, USA

**Kiyoshi Matsuda,**  
Adviser, Public Policy and Relations Office,  
Mitsubishi Chemical Holdings Corporation, Japan

**Andrew Morlet,**  
Chief Executive Officer, Ellen MacArthur Foundation,  
United Kingdom

**Mohammed Al Mualla,**  
Undersecretary for Higher Education, Ministry of Education  
of the United Arab Emirates, United Arab Emirates

**V. Ramgopal Rao,**  
Director, Indian Institute of Technology Delhi, India

**Françoise Roure,**  
Senior National Adviser, National Advisory Board on  
Economy, Industry, Energy and Technologies,  
Ministry of Economy and Finance of France

**Molly Stevens,**  
Professor of Biomedical Materials and Regenerative  
Medicine, Imperial College London, United Kingdom

**John F. Thompson,**  
Wold Family Professor in Environmental Balance for Human  
Sustainability, Cornell University, USA

**Ibo Van de Poel,**  
Professor of Ethics and Technology,  
Delft University of Technology, Netherlands

**Dimitri de Vreeze,**  
Member of the Managing Board,  
Royal DSM NV, Netherlands

**Jackie Y. Ying,**  
Institute of Bioengineering and Nanotechnology, Singapore

### Fellow:

**Yamil J. Colón,**  
Postdoctoral Researcher, University of Chicago, USA

### Council Manager:

**Fernando Gomez,**  
Head of Chemistry and Advanced Materials Industries,  
World Economic Forum, Switzerland

# The Future of Artificial Intelligence and Robotics

## Mandate and objectives:

Explore how developments in artificial intelligence and robotics could impact industry, governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are kept under control.

## Council outputs:

- Five podcasts created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series:
  1. [Autonomous Systems](#) with Mary Cummings, Director, Humans and Autonomy Lab, Duke University

2. [AI and Decision-making](#) with Bob Goodson, Chief Executive Officer and Founder, Quid Inc.
3. [Robots, Society and Employment](#) with Illah Nourbakhsh, Professor of Robotics at Carnegie Mellon University
4. [Widespread Artificial Intelligence](#) with Stuart Russell, Professor of Computer Science at the University of California, Berkeley
5. [Specialized Robots Development and Integration](#) with Alex Wyatt, Founder and Chief Executive Officer, August Robotics



## Council Members

### Co-Chairs:

**Mary Cummings,**  
Director, Humans and Autonomy Lab (HAL), Duke University, USA

**Vishal Sikka,**  
Advisory Professor, East China Normal University (ECNU), People's Republic of China

### Members:

**Julia Bossmann,**  
Director, Strategy, Fathom Computing, USA

**Paul Daugherty,**  
Chief Technology and Innovation Officer, Accenture, USA

**Imad Elhaji,**  
Professor of Electrical and Computer Engineering, American University of Beirut, Lebanon

**Pascale Fung,**  
Professor, Department of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong SAR

**Dileep George,**  
Co-Founder and Chief Technology Officer, Vicarious FPC Inc., USA

**Bob Goodson,**  
Chief Executive Officer and Founder, Quid Inc., USA

**Hong Qiao,**  
Professor, Institute of Automation, Chinese Academy of Sciences, People's Republic of China

**Hiroshi Ishiguro,**  
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**Hiroaki Kitano,**  
President and Chief Executive Officer, Sony Computer Science Laboratories Inc., Japan

**Lee Kai-Fu,**  
Chairman and Chief Executive Officer, Sinovation Ventures, People's Republic of China

**Patrick Lin,**  
Director, Ethics and Emerging Sciences Group, California Polytechnic State University (Cal Poly), USA

**James Manyika,**  
Senior Partner and Director, McKinsey Global Institute (MGI), McKinsey & Company, USA

**Illah Nourbakhsh,**  
Professor of Robotics, Robotics Institute, Carnegie Mellon University, USA

**David Peters,**  
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**Francesca Rossi,**  
Distinguished Researcher, IBM, USA

**Deb Roy,**  
Associate Professor and Director of the Laboratory for Social Machines, Massachusetts Institute of Technology (MIT) Media Laboratory, USA

**Stuart Russell,**  
Professor of Computer Science, University of California, Berkeley, USA

**Suchi Saria,**  
John C. Malone Assistant Professor, Department of Computer Science, Johns Hopkins University, USA

**David Shim,**  
Associate Professor, Department of Aerospace Engineering, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

**Navrina Singh,**  
Principal Product Lead, Microsoft Corporation, USA

**Alex Wyatt,**  
Founder and Chief Executive Officer, August Robotics, People's Republic of China

**Xiong Rong,**  
Professor, Institute of Cyber Systems and Control, Zhejiang University, People's Republic of China

**Zhang Yao,**  
Member, Founder and Chief Executive Officer, RoboTerra Inc., USA

### Fellow:

**Bryan Low Kian Hsiang,**  
Assistant Professor, Department of Computer Science, National University of Singapore, Singapore

### Council Managers:

**Kay Firth-Butterfield,**  
Portfolio Head Artificial Intelligence and Machine Learning, Centre for the Fourth Industrial Revolution, World Economic Forum, USA

**Rigas Hadzilacos,**  
Practice Lead, Knowledge Networks and Analysis, World Economic Forum, Switzerland

# The Future of Biotechnologies

## Mandate and objectives:

Explore how developments in biotechnology could impact industry (especially agriculture and health), governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are kept under control.

## Council outputs:

- Contributed to Chapter 11 of the book [Shaping the Fourth Industrial Revolution](#)
- EMBO journal article “[The power of synthetic biology for bioproduction, remediation and pollution control](#)”, which explains how the biotech revolution can support the SDGs
- [An article published in the Biotechnology Journal](#), which examines how some of the most well-known biotechnologies (genome editing, stem cell therapy, tissue engineering and precision medicine) can benefit patients and provide perspective on the additional value these same technologies could offer 20 years from now, after addressing technical challenges as well as ethical, legal and socio-economic concerns
- Created a series of World Economic Forum’s Agenda blogs: “[How biotechnology is evolving in the Fourth Industrial Revolution](#)” by Victor de Lorenzo; “[Precision healthcare: how maths can revolutionise medicine](#)” by Diego Oyarzun; “[Trust in tech governance: the one success factor common to all 4IR technologies](#)” by Conrad Von Kameke

- A podcast on [The importance of food and precision medicine in the ageing society](#) with Sang-Yup Lee
- A briefing paper that advances the agenda of industrial biotech within the chemicals industry presented at the Governors meeting at the Annual Meeting 2018
- Cross-council collaborations in industrial biotechnology with the Chemistry and Advanced Materials industry
- Science-based recommendations on how to increase chances for effective governance of emerging technologies to earn political and societal trust, incorporating lessons from the history of GMOs. Served to launch the [TIGTech initiative](#), supported by the World Economic Forum and in collaboration with Fraunhofer Institute of Systems and Innovation Research. The initiative seeks to understand how governance may differ, and in what ways, if the earning of trust is considered and incorporated into governance design
- Supported the [Bio-Innovation Dialogue Initiative](#) and contributed to the white paper [Bio-Innovation in the Food System: Towards a New Chapter in Multistakeholder Collaboration](#)
- Served as advisory board to the [Precision Medicine Project](#)

## Council Members

### Co-Chairs:

#### Lee Sang-Yup,

Distinguished Professor, Department of Chemical and Biomolecular Engineering and Dean, KAIST Institutes, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

#### Zhang Feng,

James and Patricia Poitras Professor in Neuroscience, Massachusetts Institute of Technology (MIT), USA

### Members:

#### Habiba Al Alsafar,

Assistant Professor, Department of Biomedical Engineering, Khalifa University of Science, Technology and Research (KUSTAR), United Arab Emirates

#### Cao Cong,

Professor of Innovation Studies, University of Nottingham Ningbo China, People’s Republic of China

#### George Chen Guo-Qiang,

Professor, School of Life Sciences, Tsinghua University, People’s Republic of China

#### Cynthia Collins,

Associate Professor, Department of Chemical and Biological Engineering, Rensselaer Polytechnic Institute (RPI), USA

#### Thomas M. Connelly,

Executive Director and Chief Executive Officer, American Chemical Society, USA

#### Per Falholt,

Chief Executive Officer and Founder, Per Falholt Global R&D Advisory Services, Denmark

#### Sehamuddin Galadari,

Senior Vice-Provost, Research Outreach; Managing Director, Research Institute; Professor of Biology, New York University Abu Dhabi, United Arab Emirates

#### Henry T. Greely,

Deane F. and Kate Edelman Johnson Professor of Law, Stanford University, USA

#### Leticia Hosta-Rigau,

Associate Professor, Department of Micro- and Nanotechnology, Technical University of Denmark, Denmark

#### Ji Weizhi,

Director, Yunnan Key Laboratory of Primate Biomedical Research, Institute of Primate Translational Medicine, Kunming University of Science and Technology, People’s Republic of China

#### Benjamin Laga,

Head, Trait Discovery, Bayer Crop Science, Belgium

#### Victor de Lorenzo,

Director, Systems Biology Programme; Head, Molecular Environmental Microbiology Laboratory, Spanish Council for Scientific Research (CSIC), Spain

#### Elizabeth O’Day,

Founder and Chief Executive Officer, Olaris Therapeutics, USA

#### Babatunde Ogunnaike,

Dean, College of Engineering, University of Delaware, USA

#### Hideyuki Okano,

Professor of Physiology, Keio University, Japan

#### Gonçalo Pereira,

Chief Scientific Officer, GranBio Investimentos SA, Brazil

#### Conrad von Kameke,

Head, Strategy, BioInnovators Europe, Germany

#### Kristala Prather,

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#### Rekha Ramesh,

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#### Richard J. Roberts,

Research Director, New England Biolabs, USA

#### Mostafa Ronaghi,

Senior Vice-President; Chief Technology Officer, Illumina Inc., USA

#### Anne Wojcicki,

Chief Executive Officer and Co-Founder, 23andMe Inc., USA

#### Karen Yeung,

Director, Centre for Technology, Law and Society, King’s College London, United Kingdom

### Fellow:

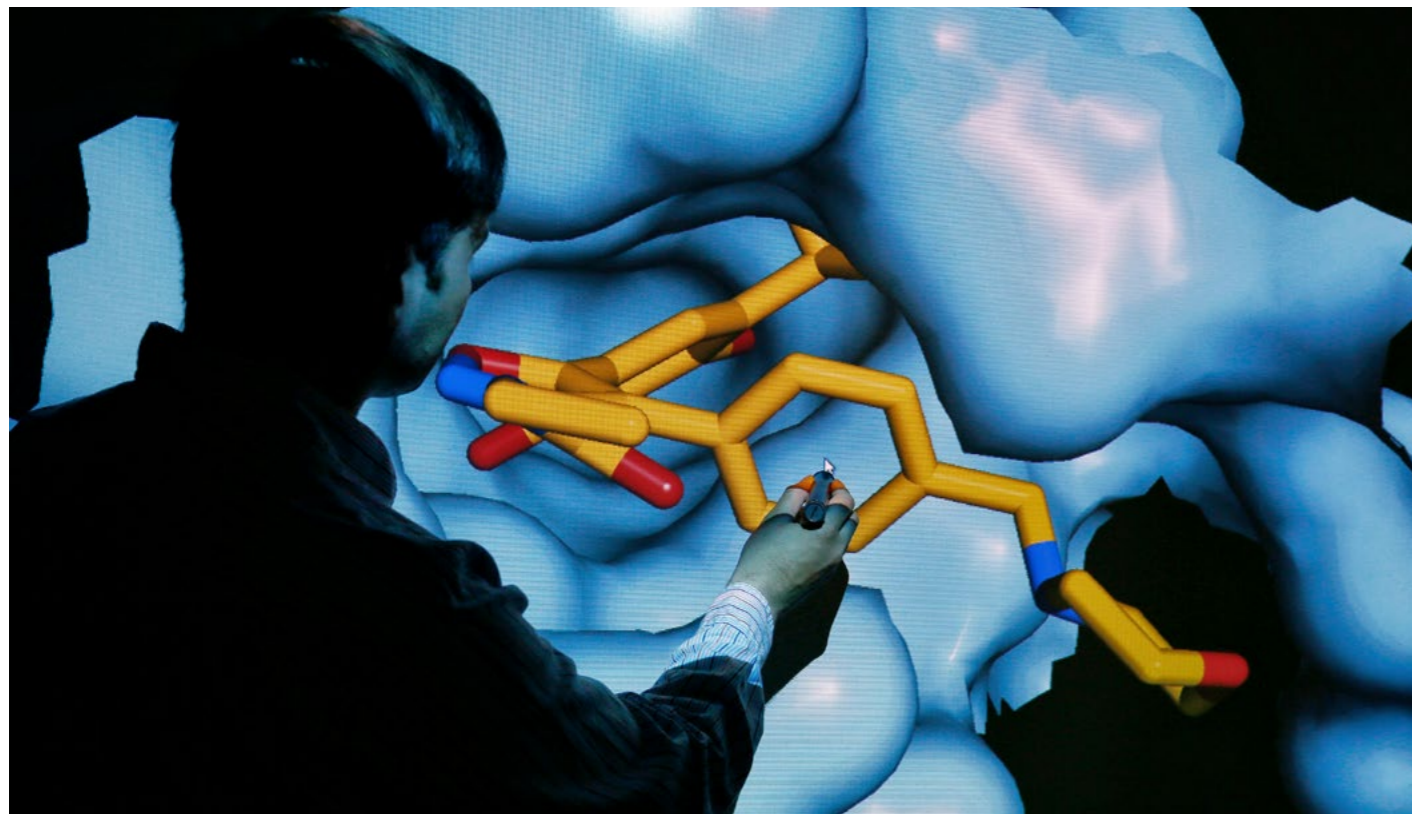
#### Diego Oyarzún,

Research Fellow, Imperial College London, United Kingdom

### Council Manager:

#### Amira Ghouaibi,

Community Lead, Global Health and Healthcare Industries, World Economic Forum, Switzerland



# The Future of Blockchain

## Mandate and objectives:

Explore how the blockchain could impact industry, governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are mitigated.

## Council outputs:

- White paper on [Blockchain Beyond the Hype](#), which presents a practical framework designed to assist executives in understanding whether blockchain is an appropriate and helpful tool for their business needs
- An editorial document that provides an overview of the most interesting and promising experiments using distributed ledger technology to deliver innovative solutions to global challenges

- Three podcasts created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast and [Mapping Global Transformations](#) series:
  1. [Technology and Governments](#) with Toomas Hendrik Ilves, President of Estonia (2006-2016), on a successful transition to e-governance
  2. [Blockchain](#) with Jamie Smith, Global Chief Communications Officer at BitFury Group, on the technology behind the Bitcoin
  3. [Blockchain](#) with Will Knottenbelt, Professor at Imperial College London, and Catherine Mulligan, Co-Director, Centre for Cryptocurrency Research and Engineering at Imperial College London
- Curation of the [Blockchain Transformation Map](#) led by Catherine Mulligan, with the support of other council members

## Council Members

### Co-Chairs:

**Toomas Hendrik Ilves,**  
President of Estonia (2006-2016),  
Office of the President of Estonia

**Jamie Smith,**  
Global Chief Communications Officer, The Bitfury Group,  
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Global Head, Innovation, Thomson Reuters, USA

**Brian Behlendorf,**  
Executive Director, Hyperledger, Linux Foundation, USA

**Richard Brown,**  
Chief Technology Officer, R3 CEV, United Kingdom

**Primavera De Filippi,**  
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**Meltem Demirors,**  
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**Karen Gifford,**  
Chief Compliance Officer, Ripple, USA

**Leanne Kemp,**  
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**Lee Xiaodong,**  
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**Adam Ludwin,**  
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**Ma Jun,**  
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**Anju Patwardhan,**  
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**Justin Pinkham,**  
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MasterCard Labs, Mastercard, USA

**JP Rangaswami,**  
Chief Data Officer, Deutsche Bank AG London, United  
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**Elizabeth Rossiello,**  
Member, Chief Executive Officer, Founder, BitPesa,  
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**Carsten Stöcker,**  
CEO, Spherity, Germany

**Osman Sultan,**  
Chief Executive Officer, Emirates Integrated  
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**Claire Sunderland Hay,**  
Head, FinTech Accelerator, Bank of England, United  
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**Simon Taylor,**  
Co-Founder; Director, Blockchain, 11:FS, United Kingdom

**Jeremy Wilson,**  
Vice-Chairman, Corporate Banking, Barclays Bank Plc,  
United Kingdom

**Jennifer Zhu Scott,**  
Principal, Radian Partners, Hong Kong SAR

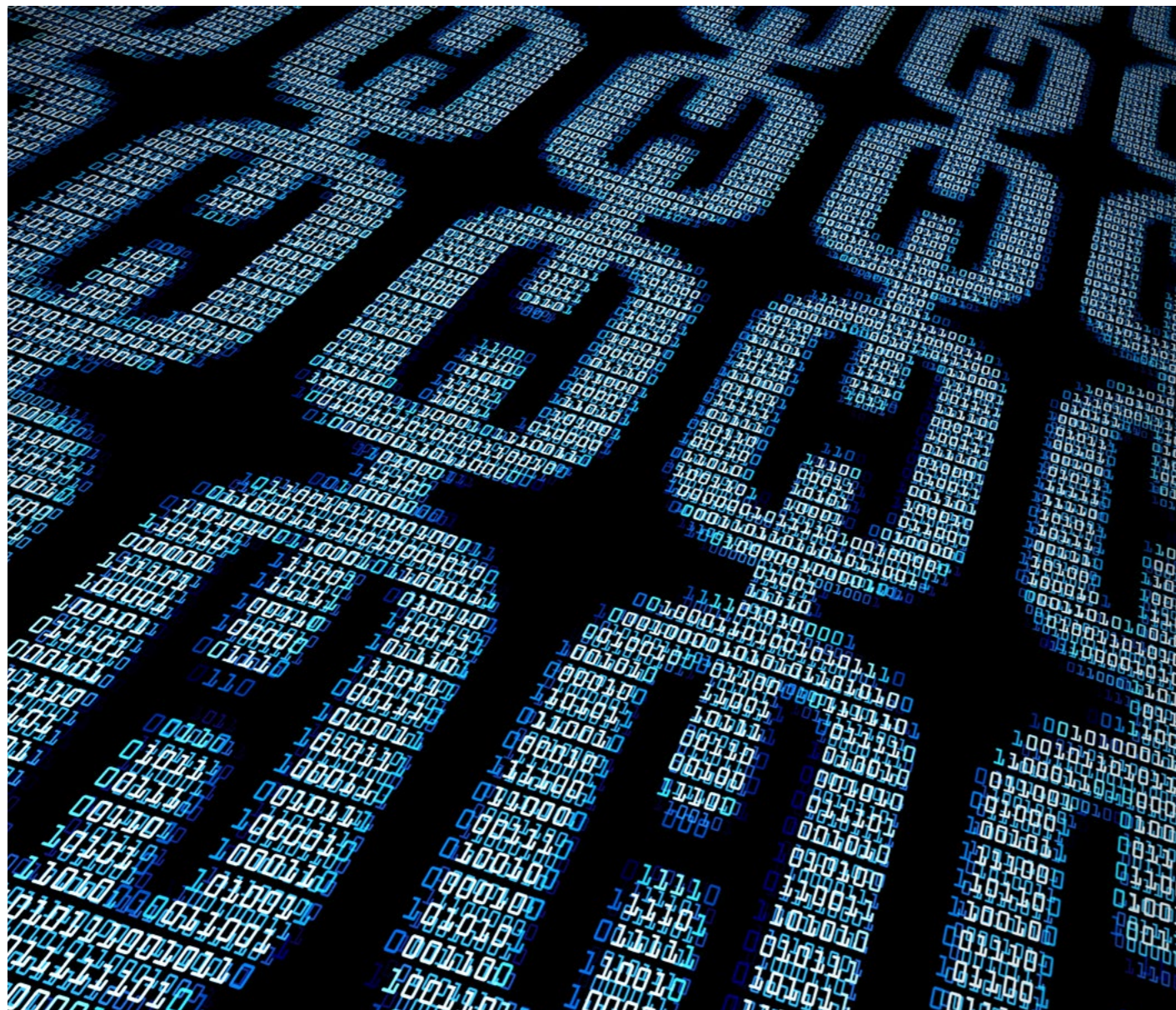
### Fellow:

**Catherine Mulligan,**  
Co-Director, Centre for Cryptocurrency Research and  
Engineering, Imperial College London, United Kingdom

### Council Managers:

**Jesse Mcwaters,**  
Community Curator, Financial Services Industry,  
World Economic Forum, USA

**Sheila Warren,**  
Project Head, Blockchain and Distributed Ledger  
Technology, World Economic Forum, USA



# The Future of Cities and Urbanization

## Mandate and objectives:

Identify the systemic problems encountered by cities and how to apply solutions in the context of the Fourth Industrial Revolution. The council collated best practice examples of how cities are using new technology, data collection and analysis to improve services and liveability for their citizens. They also collated best practice examples of how cities are embracing agility as they harness the opportunities provided by the Fourth Industrial Revolution.

## Council outputs:

- White paper on [Agile Cities: Preparing for the Fourth Industrial Revolution](#) highlights what cities need to do to prepare for the opportunities provided by the Fourth Industrial Revolution
- White paper on [Data Driven Cities: 20 Stories of Innovation](#) highlights examples from around the world of how cities are using new technology, data collection and analysis to improve services and liveability for their citizens. The report is part of a wider initiative by the World Economic Forum to empower city leadership in preparedness for the transformations of the Fourth Industrial Revolution
- Series of Agenda blogs, including “[Cities must manage their water better or risk drought](#)” by Toshiko Mori and Virginia Gresham; “[Lessons in public transport, from a](#)

mountain city with 20 volcanoes” by Mauricio Rodas Espinel; “[How tomorrow’s buildings will make you – and the planet – healthier](#)” by Diane Hoskins; “[How smart tech helps cities fight terrorism and crime](#)” by Robert Muggah; “[Here’s how nature and cities can thrive together](#)” by Carlo Ratti; “[Cities can become smarter, by going circular](#)” by Anil Menon; and “[Why this Danish city is rebuilding itself out of recycled rubble](#)” by Ida Auken

- [2017 Forum on the Future of Cities: Cities & the Fourth Industrial Revolution \(4IR\) Conference](#), co-hosted by the Global Future Council on Cities and Urbanization and MIT, Smart Dubai and PwC on 13 November 2017 in Dubai, UAE
- Future Mobility conference, masterclass and workshop in BloxHub, Copenhagen, Denmark, co-hosted with the Danish Design Centre and the Danish Municipality of Faaborg-Midtfyn, on Wednesday 27 June 2018
- Podcast on [Cities and Urbanization](#) with Abha Joshi-Ghani, Senior Adviser, Infrastructure, Public-Private Partnerships and Guarantees, The World Bank, and Carlo Ratti, Director, SENSEable City Laboratory MIT; created as part of the World Economic Forum’s [A Glimpse into the Future](#) podcast series
- Assistance with framing the Global Shapers’ City Preparedness for the Fourth Industrial Revolution challenge

## Council Members

### Co-Chairs:

**Abha Joshi-Ghani,**  
Senior Adviser, Infrastructure, Public-Private Partnerships and Guarantees, The World Bank, USA

**Carlo Ratti,**  
Director, SENSEable City Laboratory MIT - Department of Urban Studies and Planning, USA

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City Design and Projects, City of Melbourne, Australia

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Graduate School of Architecture, Planning and Preservation, Columbia University, USA

**Ida Auken,**  
Member of Parliament, Parliament of Denmark (Folketinget), Denmark

**Aisha Butti Bin Bishr,**  
Director-General, Smart Dubai Office, United Arab Emirates

**C. Nicholas Brooke,**  
Chairman, Hong Kong Harbourfront Commission, Hong Kong SAR

**Gretchen Effgen,**  
Vice-President, Global Partnerships, nuTonomy Inc., USA

**Mauricio Rodas Espinel,**  
Mayor of Quito, Municipality of Quito, Ecuador

**Rosemary Feenan,**  
Executive Vice President, Research, Quad Real, Canada

**Hazem Galal,**  
Global Leader, Cities and Local Government, PwC, United Arab Emirates

**Barry Hirschfeld,**  
President and Chief Executive Officer, AIP Healthcare Japan GK, Japan

**Diane Hoskins,**  
Co-Chief Executive Officer, Gensler, USA

**Daniel Koh,**  
Chief of Staff, City of Boston, USA

**Varvara Melnikova,**  
Chief Executive Officer, Strelka Institute for Media, Architecture and Design, Russian Federation

**Anil Menon,**  
Global President, Smart+Connected Communities, Cisco Systems Inc., USA

**Toshiko Mori,**  
Robert P. Hubbard Professor in the Practice of Architecture, Harvard University Graduate School of Design, USA

**Robert Muggah,**  
Research Director, Igarapé Institute, Brazil

**Juan Jose Pocaterra,**  
Co-Founder and Chief Executive Officer, ViKua, Venezuela

**Didier G. Sagashya,**  
Executive Secretary, Kigali City Council, Rwanda

**Jens Martin Skibsted,**  
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**Harry Verhaar,**  
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**Geoffrey B. West,**  
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### Fellow:

**Adrian Chong,**  
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### Council Managers:

**Alice Charles,**  
Project Lead, Cities, World Economic Forum, Switzerland

**Julie Ziskind,**  
Project Lead, Cities, Global Leadership Fellow, World Economic Forum, Switzerland



# The Future of Computing

## Mandate and objectives:

Explore how developments in computing could impact industry, governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are kept under control.

## Council outputs:

- Chapter contribution from Ghida Ibrahim, Data Scientist, Infrastructure Engineering at Facebook Inc., to the white paper [The Digital Arab World: Understanding and embracing regional changes in the Fourth Industrial Revolution](#). The white paper was launched at the World Economic Forum Annual Meeting 2018
- Chapter contribution to the book [Shaping the Fourth Industrial Revolution](#) on “New Computing Capabilities”
- Workshop on “Shaping forms and uses of computing for a human-centred, inclusive future in the Fourth Industrial

Revolution” at the Hewlett Packard Executive Briefing Centre in Palo Alto, USA, June 2018

- Two podcasts created as part of the World Economic Forum’s [A Glimpse into the Future](#) podcast series:
  1. [Computing](#) with Justine Cassell, Associate Dean, Technology, Strategy and Impact, School of Computer Science, Carnegie Mellon University
  2. [Quantum Computing, Energy and Health](#) with Jeremy O’Brien, Director of the Centre for Quantum Photonics, University of Bristol
- A suite of thought products on the future of computing for the Forum’s community, which ranges from physical materials sciences to developments in interface technology, AI, the quantum potential of computing. This included the Agenda blogs “[A new era of computing is coming. How can we make sure it is sustainable?](#)” and “[By 2030, this is what computers will be able to do](#)”; as well as videos and articles

## Council Members

### Co-Chairs:

**Justine Cassell,**  
Associate Dean, Technology, Strategy and Impact, School of Computer Science, Carnegie Mellon University, USA

**Jeremy O’Brien,**  
Chief Executive Officer, PsiQuantum, USA.

### Members:

**Elissa Aminoff,**  
Assistant Professor of Psychology, Fordham University, USA

**Bryn Balcombe,**  
Chief Strategy Officer, Roborace, United Kingdom

**Kirk Bresniker,**  
Chief Architect, Hewlett Packard Labs, Hewlett Packard Enterprise, USA

**Pavel Durov,**  
Chief Executive Officer, Telegram Messenger LLP, Finland

**Andrew Fursman,**  
Chief Executive Officer, 1QB Information Technologies (1QBit), Canada

**Ghida Ibrahim,**  
Data Scientist, Infrastructure Engineering, Facebook Inc., United Kingdom

**Ji Heng,**  
Edward P. Hamilton Development Chair Associate Professor in Computer Science, Rensselaer Polytechnic Institute (RPI), USA

**Wendy Ju,**  
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**Ajit Manocha,**  
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**Amanda Randles,**  
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**Frank Smith,**  
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**Leila Takayama,**  
Acting Associate Professor of Psychology, University of California, Santa Cruz, USA

**Khai Truong,**  
Associate Professor and Associate Chair for Research, Department of Computer Science, University of Toronto, Canada

**Vlatko Vedral,**  
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**Kirill Veselkov,**  
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**Andreas Wallraff,**  
Professor of Solid State Physics, Department of Physics, ETH Zurich, Switzerland

**Wei Shaojun,**  
Professor, Institute of Microelectronics, Tsinghua University, People’s Republic of China

### Fellow:

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Associate Professor, Department of Systems Innovation, The University of Tokyo, Japan

### Council Managers:

**Anne Marie Engtoft Larsen,**  
Knowledge Lead, Science and Technology Studies, World Economic Forum, Switzerland

**Danil Kerimi,**  
Head of Information Technology and Electronics Industries, World Economic Forum, USA





# The Future of Consumption

## Mandate and objectives:

Explore the future of the system of consumption, addressing the following dimensions: changing face of the consumer; new patterns of consumption, and advancement of technology.

## Council outputs:

– Produced three case studies:

1. [Forget Altruism! Terracycle's Diaper Venture to Monetize the Circular Economy's Dirtiest](#)
2. [Alibaba's China Fish Pond Venture: Crystal Ball into the Future of Global Consumption?](#)
3. [The Rakuten of \(All\) Things: 'Data with Soul' to Challenge Amazon](#)

– Contributed a series of blogs, including “We can recycle everything we use, including cigarette butts and toothbrushes. So why don't we?” by Tom Szaky; “The Future of Consumption – A Closer Look” by Sandeep Dadlani; “We don't need to consume less – we just need to design better products” by Lewis Perkins; “From spider silk shoes to algae fuel, welcome to the new age of biotech” by Andras Forgacs; and “How to build a business in the circular economy” by Tomas Casas and Stefan Legge

– Podcast on the future of Consumption with Elaine Coventry, Head, Commercial Leadership, Western Europe, The Coca-Cola Company; created as part of the World Economic Forum's [A Glimpse into the Future podcast series](#)



## Council Members

### Co-Chairs:

**Elaine Coventry,**  
Head, Commercial Leadership, Western Europe, The Coca-Cola Company, United Kingdom

**Helen Hai,**  
Goodwill Ambassador, United Nations Industrial Development Organization (UNIDO), People's Republic of China

### Members:

**Anna Bergare,**  
Head, Global Brand Management, Hennes & Mauritz AB, Sweden

**Wayne Best,**  
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**Joss Blériot,**  
Executive Officer, Ellen MacArthur Foundation, United Kingdom

**Tomas Casas i Klett,**  
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**Kristy Caylor,**  
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**Aron Cramer,**  
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**Sandeep Dadlani,**  
Chief Digital Officer, Mars Inc., USA

**Sanjay Dhiri,**  
Director, Bain & Company Inc., United Kingdom

**Maitha Al Dossari,**  
Chief Executive Officer, Emaar Entertainment, Emaar Properties PJSC, United Arab Emirates

**Nathan Eagle,**  
Co-Founder and Chief Executive Officer, Jana, USA

**Murat Emirdag,**  
Founder, M-Factory Ventures LLC, USA

**Anna Fang Hamm,**  
Partner and Chief Executive Officer, Zhen Fund, People's Republic of China

**Andras Forgacs,**  
Chief Executive Officer, Modern Meadow Inc., USA

**Johnny Hammond,**  
Director, Global Marketing, Unilever, United Kingdom

**Derrick Johnson,**  
Vice-President, Customer Segment Marketing, UPS, USA

**Vino El Khatib,**  
Chief Marketing and Brand Officer, Majid Al Futtaim Holding, United Arab Emirates

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**Brian Robbins,**  
Associate Director, Analytics and Insights, Global Beauty and Hair Care, Procter & Gamble, USA

**Rachel Shechtman,**  
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**Tom Szaky,**  
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**Rodrigo Teijeiro,**  
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Community Lead, Retail, Consumer Goods and Lifestyle Industry, World Economic Forum, USA

**Andrew Moose,**  
Head of Retail, Consumer, and Lifestyle Industries, World Economic Forum, USA

# The Future of Cybersecurity

## Mandate and objectives:

Establish a comprehensive picture of the implications, impacts, and effects of cyber risk within the future systemic environment of the Fourth Industrial Revolution across industry and innovation, government and policy regulation, and civil society. From an executive decision-making perspective describe how cybersecurity can serve as a key element, enabler and shaper of system design and the development of new technologies in the Fourth Industrial Revolution.

## Council outputs:

- Scenarios for the [Cybersecurity Futures 2025 initiative](#), a collaboration between the World Economic Forum's

Centre for Cybersecurity, UC Berkeley Center for Long-Term Cybersecurity and CNA's Institute for Public Research, which aims to shape a forward-looking research and policy agenda to create a cybersecurity landscape in 2025 and help decision-makers in government, industry and civil society reduce frictions, seize opportunities for cooperation and better prepare for the future

- A dialogue series on scenarios involving the public and private sectors
- Podcast on [Cybersecurity](#) with Alan D. Cohn, Adjunct Professor, Georgetown University Law Center, created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series

## Council Members

### Co-Chair:

**Alan D. Cohn,**  
Adjunct Professor of Law,  
Georgetown University Law Center, USA

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**Chan Cheow-Hoe,**  
Government Chief Information Officer, Government  
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**Cheri McGuire,**  
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Standard Chartered Bank, United Kingdom

**Peter Micek,**  
General Counsel Access Now, USA

**Sultan Al-Owais,**  
Director, Information and Cyber Security, Emirates Nuclear  
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**Samir Saran,**  
President, Observer Research Foundation (ORF), India

**Satoko Shisai,**  
Vice President, IBM Security,  
Chief Information Security Officer, IBM, Japan

**Al Tarasiuk,**  
Chief Information Security Officer, Deutsche Bank AG, USA

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Chief Executive Officer, Marsh Limited,  
Marsh & McLennan Companies, United Kingdom

**Jane Zavalishina,**  
Chief Executive Officer, Yandex Data Factory,  
Yandex, Russian Federation

**Zhao Zeliang,**  
Director-General, Cyberspace Administration of China,  
People's Republic of China

### Fellow:

**Mariarosaria Taddeo,**  
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### Council Manager:

**Karen Chiao Lin Wong,**  
Strategic Affairs, Implementation and Coordination  
Manager, Centre for Cybersecurity, World Economic Forum,  
Switzerland



# The Future of Digital Economy and Society

## Mandate and objectives:

Advise the World Economic Forum System Initiative on Shaping the Future of Digital Economy and Society, which aims to shape an inclusive, sustainable and trustworthy digital future. Also, identify future issues and solutions and generate insights on six shared global goals: access and adoption; responsible digital transformation; fit for purpose governance; secure and resilient processes; human-centric digital identities; and trusted data sharing.

## Council outputs:

- Acted as an advisory body for the World Economic Forum System Initiative on Shaping the Future of Digital Economy and Society to shape its interventions on six shared global outcomes: access and adoption; responsible digital transformation; fit-for-purpose governance; secure and resilient processes; human-centric digital identities; and trusted data sharing. Council's contribution to thought leadership included a 2017 analysis of [opportunities, risks and strategies](#) in the digital economy and a 2018 publication [Our Shared Digital Future](#) identifying priorities for global collaboration on these six outcomes

- Acted as key facilitators at the 2018 Digital Economy & Society Community Meeting, 20-21 March, in San Francisco to advance collaboration on the six outcomes
- Contributed podcast on the [Digital Economy](#) with Arun Sukumar, Head of the Cyber Initiative at the Observer Research Foundation; Marietje Schaake, Member of the European Parliament; and Richard Soley, Chairman and Chief Executive Officer of the Object Management Group, and Executive Director of the Industrial Internet Consortium; created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series
- Contributed blogs on Forum Agenda including Brandie Nonnecke on how [AI can make our societies equal](#), Scott David on how [Fourth Industrial Revolution can help us prepare for the next natural disaster](#), Carl Bildt on [redefining Europe and Europeans](#), Maya Bundt on [cyber risks and insurance](#), Mei Lin Fung on [making the digital economy sustainable](#), and Arvind Gupta on [the value of data](#)
- Contributed to the [Transformation Map](#) on digital economy and society

## Council Members

### Co-Chairs:

**Mathews A. P. Chikaonda,**  
Chair, Press Corporation Limited, Malawi

**Victoria A. Espinel,**  
President and Chief Executive Officer,  
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### Members:

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**Carl Bildt,**  
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**David Dean,**  
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**Clarisa Estol,**  
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**Fung Mei-Lin,**  
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**Arvind Gupta,**  
Chief Technology Officer, Bharatiya Janata Party (BJP), India

**Mikael Hagstroem,**  
President and Chief Executive Officer, MetricStream, USA

**Wendy Hall,**  
Director, Web Science Institute,  
University of Southampton, United Kingdom

**Christian Lanng,**  
Chief Executive Officer, Chairman and Co-Founder,  
Tradeshift, USA

**Alan Murray,**  
President, Fortune; Chief Content Officer,  
Time Inc., USA

**Amanda Noonan,**  
Strategy Director, frogImpact, frog design inc., USA

**Burke Norton,**  
Principal and Co-Head of Perennial Investing,  
Vista Equity Partners, USA

**Jean Philbert Nsengimana,**  
Former Minister, Ministry of Information Technology  
and Communication of Rwanda

**Gloria Pasadilla,**  
Senior Analyst, APEC Secretariat  
(Asia-Pacific Economic Cooperation), Singapore

**Robert Pepper,**  
Head, Global Connectivity and Technology Policy  
Facebook Inc., USA

**Atefeh Riazi,**  
Chief Information Technology Officer, United Nations Office  
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**Marietje Schaake,**  
Member of the European Parliament, Netherlands

**Richard Soley,**  
Chairman and Chief Executive Officer,  
Object Management Group, USA

**Arun Mohan Sukumar,**  
Head, Cyber Initiative, Observer Research Foundation  
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**Adrian Turner,**  
Chief Executive Officer Data61, Commonwealth Scientific  
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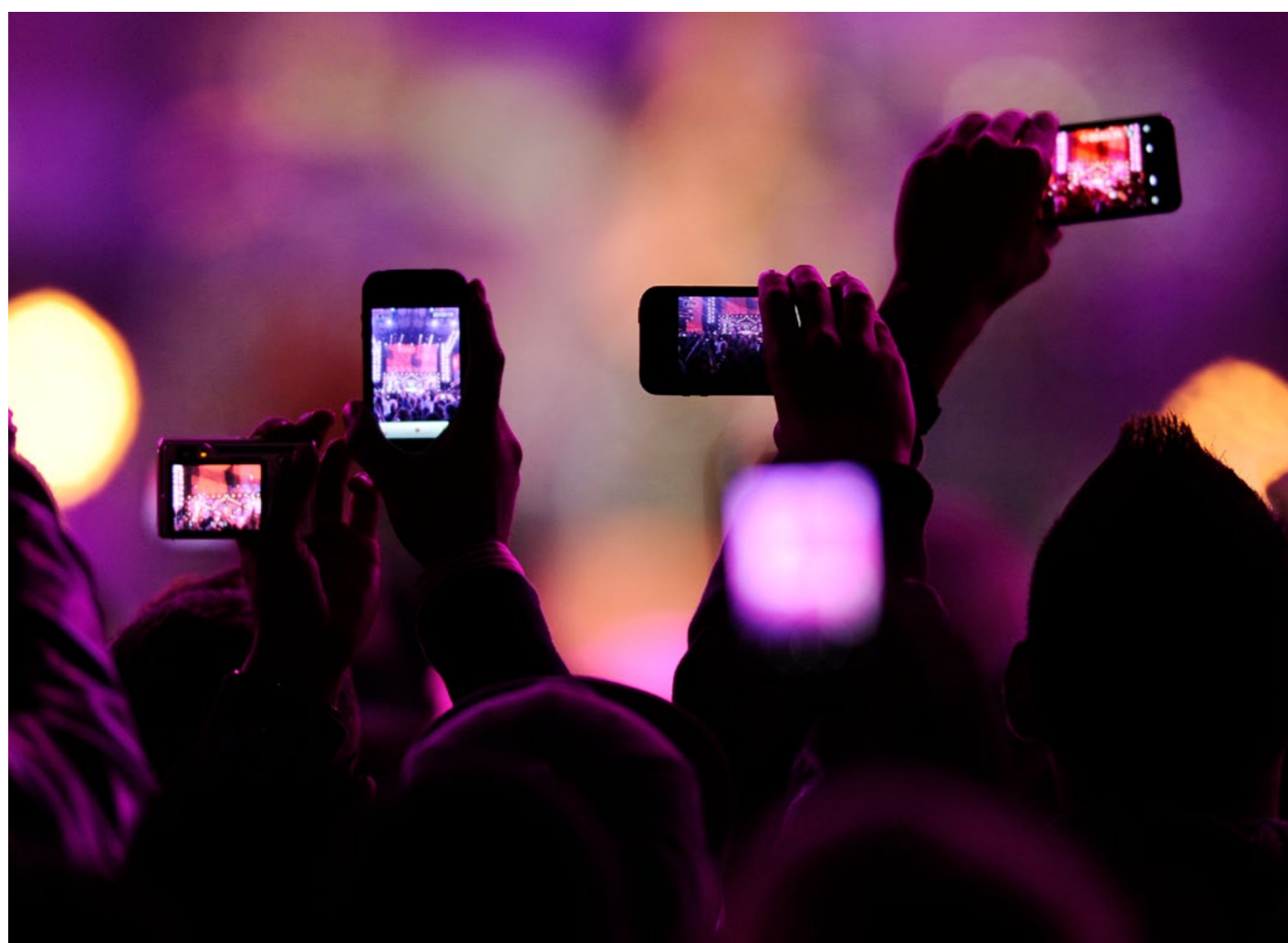
**Wu Hequan,**  
President, Internet Society of China,  
People's Republic of China

### Fellow:

**Brandie Nonnecke,**  
Postdoctoral Fellow, University of California, Berkeley, USA

### Council Manager:

**Mark Spelman,**  
Co-Head, Digital Economy and Society System Initiative,  
World Economic Forum, Switzerland



# The Future of Economic Progress

## Mandate and objectives:

Explore the challenges and opportunities linked to enabling economic growth and social inclusion in the age of the Fourth Industrial Revolution. It will develop ideas for progress along four dimensions: making globalization more inclusive; unlocking productivity and potential; promoting multidimensional inclusion; and tackling the rise of echo chambers.

## Council outputs:

- Produced a briefing note with key insights for the System Initiative on Shaping the Future of Economic Progress Stewardship Board meeting that took place at the World Economic Forum Annual Meeting 2018
- A series of articles and blogs, including Forum Agenda blog “[These are the 8 reasons why 2018 could be Africa’s year](#)” by Caroline Kende-Robb; Financial Times article “[The digital economy is disrupting our old models](#)” by Diane Coyle; VoxEU’s article “[Making](#)

[globalisation more inclusive: A way forward](#)” by Sergei Guriev, Danny Leipziger and Jonathan D. Ostry; Project Syndicate articles “[Inclusive Growth or Else](#)” by Sergei Guriev, Danny Leipziger and Jonathan D. Ostry, and “[Is Productivity Growth Becoming Irrelevant?](#)” by Adair Turner; and The Washington Post’s article “[How nationalism can actually help democracies](#)” by Maya Tudor

- Podcast on [An Inclusive Revolution?](#) with Danny Leipziger, Managing Director of the Growth Dialogue; Jonathan Ostry, Deputy Director of the Research Department at the International Monetary Fund; Sergei Guriev, Chief Economist of the European Bank of Reconstruction and Development; Jeremy Howard, deep learning expert and founder of Fast.AI; and Margareta Drzeniek-Hanouz, former Head of Future of Economic Progress and Member of the Executive Committee at the World Economic Forum; created as part of the World Economic Forum’s [Shaping the Fourth Industrial Revolution podcast series](#)



## Council Members

### Co-Chairs:

**Diana Farrell,**  
Chief Executive Officer and President, JPMorgan Chase Institute, USA

**Frannie Léautier,**  
Founder and Managing Partner, The Fezembat Group, France

### Members:

**Yonatan Adiri,**  
Founder and Chief Executive Officer, Healthy.io, Israel

**Ruchi Bhowmik,**  
Senior Vice President, Global Public Policy & Govt. Affairs, North America, PepsiCo Inc., USA

**Martin Burt,**  
Founder and Chief Executive Officer, Fundación Paraguaya, Paraguay

**Vincent Chin,**  
Senior Partner and Managing Director, Head of South-East Asia, The Boston Consulting Group, Malaysia

**Diane Coyle,**  
Bennett Professor of Public Policy, Cambridge University, United Kingdom

**Fu Jun,**  
Academic Dean and Professor, School of Government, Peking University, People’s Republic of China

**Simón Gaviria Muñoz,**  
Visiting scholar, New York University, USA

**Sergei Guriev,**  
Chief Economist, European Bank for Reconstruction and Development (EBRD), United Kingdom

**Tom Hulme,**  
General Partner, Google Ventures, United Kingdom

**Mohamad Al-Ississ,**  
Director, Economic and Social Development Office of His Majesty King Abdullah of Jordan

**Caroline Kende-Robb,**  
Secretary General, Care International, Switzerland

**Danny Leipziger,**  
Managing Director, The Growth Dialogue, USA

**Achankeng Leke,**  
Leader, McKinsey Global Institute, Africa; Head, Public and Social Sector, Africa; Senior Partner, McKinsey & Company, South Africa

**Abdulla Nasser Lootah,**  
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**Dambisa Moyo,**  
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**Jonathan D. Ostry,**  
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**Edmund S. Phelps,**  
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**Shamina Singh,**  
President, Mastercard Center for Inclusive Growth, Mastercard, USA

**Tushar Singhvi,**  
Vice-President, Corporate Development and Investments, Crescent Enterprises, United Arab Emirates

**J. Adair Turner,**  
Chairman, The Institute for New Economic Thinking (INET), United Kingdom

### Fellow:

**Maya Tudor,**  
Associate Professor in Public Policy, Blavatnik School of Government, University of Oxford, USA

### Council Managers:

**Liana Melchenko,**  
Lead, Partnership Engagement, Future of Economic Progress, World Economic Forum, Switzerland

**Jonathan Eckart,**  
Project Specialist, Economic Growth and Social Inclusion Initiative, Global Leadership Fellow, World Economic Forum, Switzerland

# The Future of Education, Gender and Work

## Mandate and objectives:

Act as an expert advisory committee and “think tank” in the World Economic Forum’s System Initiative on Education, Gender and Work, which brings together all the activities of the Forum on these themes in a systemic way, and explore issues such as defining the core features of a future-ready education ecosystem, creating the right framework for increased participation of women in the 21st century workplace and identifying successful talent strategies, policies and regulations for emerging labour markets and the Future of Work.

## Council outputs:

- Scoped out the framework for a new Forum project – [The Promise of Platform Work](#) – to be taken forward by the Centre for the New Economy and Society in 2018-2019. The project will 1) seek to define platform work and the challenges within each type of platform model; 2) gather the available evidence of collaboration and best practices from platforms and policy-makers around the world; 3) drive dialogue between policy-makers and business leaders (from platforms across a range of industries) to shape the global discussion on managing and creating standards for digital on-demand platform work; and 4) gather business commitments for implementing new standards for platform work
- Contributed to the World Economic Forum System Initiative on Shaping the Future of Education, Gender and Work [Preparing for the Future of Work](#) project by serving as an advisory board for the development of a range of scenarios for [The Future of Jobs Report 2018](#), published at the World Economic Forum Annual Meeting 2018

- Co-created three white papers on:
  1. [Realizing Human Potential in the Fourth Industrial Revolution](#)
  2. [Accelerating Workforce Reskilling for the Fourth Industrial Revolution](#)
  3. [Accelerating Gender Parity in the Fourth Industrial Revolution](#)
- Contributed blogs on Forum Agenda, including “4 predictions for the future of work” by Stephane Kasriel; “Skill, re-skill and re-skill again. How to keep up with the future of work” by Stephane Kasriel; “6 ways to make sure AI creates jobs for all and not the few” by Stephane Kasriel; “Yes, our working lives are going through massive change, but that doesn’t mean we’re heading for a jobless world” by Stephane Kasriel; “By 2030, will we all be our own boss?” by Stephane Kasriel; “The future is automated, but what does that really mean for jobs?” by Laura D’Andrea Tyson; “The way we work is changing. This is what it could mean for you” by Laura D’Andrea Tyson; “What happens when we all live to be 100?” by Lynda Gratton; “What the banking world reveals about unconscious bias” by Eric Parrado; “Why closing the gender gap should be a priority for all of us” by Eric Parrado; “Feel undervalued at work? New research shows why that might be” by John Evans; “Technology is changing the way we live, learn and work. How can leaders make sure we all prosper?” by Erik Brynjolfsson; “Latin America has the biggest skills gap in the world. Here’s how to bridge it” by Monica Flores and Angel Melguizo; “4 things all job-seeking millennials should remember” by Monica Flores; “Why do we work and what do we get out of it?” by Yoko Ishikura; “Study, work, retire. Time to scrap the old pattern of working life” by Yoko Ishikura; “Only 11% of architects and engineers are women. Let’s build a new pipeline for female talent” by Naadiya Moosajee; and “Globalization has created wealth – but for whom?” by Rana Foroohar

## Council Members

### Co-Chairs:

**Stephane Kasriel,**  
Chief Executive Officer, Upwork, USA

**Laura D’Andrea Tyson,**  
Distinguished Professor of the Graduate School, Haas School of Business, University of California, Berkeley, USA

### Members:

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**Zoë Baird,**  
Chief Executive Officer and President, Markle Foundation, USA

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Senior Vice-President; Chief Human Resources Officer, Human Capital Management, Services and Operations, PepsiCo Inc., USA

**Holly Benson,**  
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**Azita Berar Awad,**  
Director, Employment Policy Department, International Labour Organization (ILO), Switzerland

**Erik Brynjolfsson,**  
Director, MIT Initiative on the Digital Economy, MIT - Sloan School of Management, USA

**John Evans,**  
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Minister of State for Higher Education and Advanced Skills, Ministry of Higher Education and Scientific Research of the United Arab Emirates

**Monica Flores,**  
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**Naadiya Moosajee,**  
Co-Founder, WomHub, South Africa

**Jameela Salem Al Muhairi,**  
Minister of State for General Education, Ministry of Education of the United Arab Emirates

**Faraja Nyalandu,**  
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**Eric Parrado,**  
Professor of Finance, ESE Business School, Chile

**J. Puckett,**  
Senior Partner and Managing Director, The Boston Consulting Group, USA

**Stefano Scarpetta,**  
Director, Employment, Labour and Social Affairs (DELSA), Organisation for Economic Co-operation and Development (OECD), France

**Prasad Swaminathan,**  
Senior Vice-President; Global Head, Talent and Learning, ABB Ltd, Switzerland

**Dino Varkey,**  
Chief Executive Officer, GEMS Education, United Arab Emirates

**Rebecca Winthrop,**  
Senior Fellow and Director, The Brookings Institution, USA

**Tae Yoo,**  
Senior Vice-President, Corporate Affairs and Corporate Social Responsibility, Cisco Systems Inc., USA

### Council Manager:

**Till Leopold,**  
Project Lead, Education, Gender and Work, World Economic Forum, Switzerland



# The Future of Energy

## Mandate and objectives:

As integral part of the System Initiative on Shaping the Future of Energy, act as a think tank to provide longer term (5-20 years) vision and solutions to enable an effective transition to a more sustainable, affordable, inclusive and secure global energy future. This includes identifying the risks, opportunities and hurdles to reach this future; analysing the variables that have the greatest potential for disruption and delivering clear recommendations for actions needed today.

## Council outputs:

- White papers [The Global Future Council on Energy: Policy Recommendations and Transformation of the Global Energy System](#). An [article](#) in the Washington Post describes the council's report "Transformation of the Global Energy System" as a "remarkable paper"
- Series of Forum Agenda blogs, including "[Clean energy will do to gas what gas has done to coal](#)" by Jules Kortenhorst; "[Why North America's energy future depends on Mexico's presidential campaign](#)" by David Victor; "[Geothermal mega-drills and floating reactors: the future of island power](#)" by Tony Pan; "[6 ways to align the energy transition with economic growth](#)" by Jules Kortenhorst; "[Here's how to unleash Brazil's energy revolution](#)" by Joisa Saraiva and Juan Carlos Castilla-Rubio; "[What does the future of energy look like, how do we get there, and who will benefit?](#)" by Katherine Hamilton; "[Tsunamis of innovation are shaking the energy industry](#)" by David Victor; "[Why hydrogen could be the](#)

[future of green energy](#)" by Jane Burston; "[Why things can only get better for energy consumers](#)" by Philip New; "[How can we find out what people really want from energy? Technology can help](#)" by Philip New; "[How can we ensure the energy transition leaves no worker behind?](#)" by Katherine Hamilton; "[Hot showers, warm drinks and heating – let's talk about energy the way consumers do](#)" by Philip New; "[The power plant of the future is in your home](#)" by Tony Pan; "[How Saudi Arabia can become a post-oil economy](#)" by David Hobbs; "[The world's energy is getting cleaner but not quickly enough](#)" by David Victor; "[5 predictions for energy in 2030](#)" by Jane Burston; and "[Where will our energy come from in 2030, and how green will it be?](#)" by Katherine Hamilton

- Podcast on [Energy](#) with Katherine Hamilton and Jeroen van der Veer, created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series
- [Special edition](#) of the Agenda Weekly Expert Edition newsletter, guest-edited by the council members
- Milagros Rivas Saiz discusses what it will take to achieve SDG7, challenges facing companies and what remains to be solved to increase off-grid energy access on this Forum Agenda [blog](#). This Q&A session formed the first part of a Forum interview series on energy
- Curation of the [Future of Energy Transformation Map](#) to highlight the issues and forces driving transformational change across the energy system

## Council Members

### Co-Chairs:

**Katherine Hamilton,**  
Director, Project for Clean Energy and Innovation, USA

**Jeroen van der Veer,**  
Chairman of the Supervisory Board, Royal Philips, Netherlands

### Members:

**Fahad Aldhubaib,**  
Director, New Business Development, Saudi Aramco, Saudi Arabia

**Neside Tas Anvaripour,**  
Partner, Energy Infrastructure, The Abraaj Group, United Arab Emirates

**Atul Arya,**  
Senior Vice-President and Chief Energy Strategist, IHS Energy, IHS Markit, USA

**Julia Brown of Cambridge,**  
Deputy Chair, Committee on Climate Change; Member of the House of Lords of the United Kingdom

**Jane Burston,**  
Managing Director, Clean Air Fund, United Kingdom

**John Carrington,**  
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**Brian Dames,**  
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**Arunabha Ghosh,**  
Chief Executive Officer, Council on Energy, Environment and Water (CEEW), India

**David Hobbs,**  
Head, Research, King Abdullah Petroleum Studies and Research Center, USA

**Jules Kortenhorst,**  
Chief Executive Officer, Rocky Mountain Institute, USA

**Andreas Kuhlmann,**  
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**Li Lailai,**  
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**Li Zheng,**  
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**Emilio Lozoya,**  
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**Philip New,**  
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**Teresa O'Flynn,**  
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**Tony Pan,**  
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**Mohamed Jameel Al Ramahi,**  
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**Leonardo Beltran Rodriguez,**  
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**Milagros Rivas Saiz,**  
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**Joisa Saraiva,**  
Professor of Economics, Fundação Getulio Vargas, Brazil

**Amrita Sen,**  
Co-Founder and Chief Oil Analyst, Energy Aspects Ltd, United Kingdom

**David G. Victor,**  
Professor of International Relations, University of California, San Diego (UCSD), USA

**Eirik Waerness,**  
Senior Vice-President and Chief Economist, Equinor ASA, Norway

**Joan Wills,**  
Chief Technical Director, Power Systems Global Platform 3, Cummins Inc., USA

**Duncan Wood,**  
Director, Mexico Institute, The Woodrow Wilson International Center for Scholars, USA

### Fellow:

**Paasha Mahdavi,**  
Assistant Professor of Public Policy, Georgetown University, USA

### Council Managers:

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Head of Knowledge Management, System Initiative for the Future of Energy, World Economic Forum, Switzerland

**Roderick Weller,**  
Platform Curation Lead, System Initiative for the Future of Energy, World Economic Forum, Switzerland

**Oliver Paul,**  
Community Specialist, System Initiative for the Future of Energy, World Economic Forum, Switzerland



# The Future of Environment and Natural Resource Security

## Mandate and objectives:

Explore the future of the system of environment and natural resource security, comprising: increasing resource risks and insecurity related to climate change; investment in mitigation and adaptation to climate change; creating the right framework for smart resource governance; industry adaptation to consumer demands for sustainability; and creating a sustainable supply chain system.

## Council outputs:

- Helped identify, design and scale up new areas of work where the World Economic Forum's System Initiative could play a role in shaping the agenda and creating systemic change, such as the [Meat: the Future dialogue series](#), the [Earth BioGenome Project](#) and [Earth Bank of Codes](#) and the [Fourth Industrial Revolution for the Earth](#) – now an official Forum project run by the Forum's Centre for the Fourth Industrial Revolution. Within this project, the council has also been instrumental in the second year of the council term in surfacing and shaping specific workstreams related to Fourth Industrial Revolution technologies for environment, such as the

energy blockchain project, the weather data track, genome sequencing for biodiversity, among others

- Series of Fourth Industrial Revolution for the Earth publications. These white papers were instrumental in opening dialogues on the opportunities and unintended consequences that Fourth Industrial Revolution technologies represent for environmental management:
  1. [Harnessing the Fourth Industrial Revolution for Life on Land](#)
  2. [Harnessing the Fourth Industrial Revolution for the Earth](#)
  3. [Harnessing the Fourth Industrial Revolution for Sustainable Emerging Cities](#)
  4. [Harnessing Artificial Intelligence for the Earth](#)
  5. [Harnessing the Fourth Industrial Revolution for Oceans](#)
- Podcast on [Environment and Natural Resources](#) with Jim Leape, Co-Director, Center for Ocean Solutions at Stanford University, and Celine Herweijer, Partner, PwC, created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series



## Council Members

### Co-Chairs:

**Steve Howard,**  
Co-Chair, We Mean Business Coalition, United Kingdom

**Usha Rao-Monari,**  
Chief Executive Officer, Global Water Development Partners, USA

### Members:

**Seema Arora,**  
Deputy Director General, Confederation of Indian Industry (CII), India

**Giulio Boccaletti,**  
Chief Strategy Officer, The Nature Conservancy, United Kingdom

**Fred Boltz,**  
Managing Director, Ecosystems, The Rockefeller Foundation, USA

**Juan Carlos Castilla-Rubio,**  
Chairman, Space Time Ventures, Brazil

**Shannon M. Dosemagen,**  
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**Patricia Dwyer,**  
Founder and Director, The Purpose Business Ltd, Hong Kong SAR

**Christopher Field,**  
Director, Stanford Woods Institute for the Environment, Stanford University, USA

**J. Carl Ganter,**  
Managing Director, Circle of Blue, USA

**Francisco Suárez Hernández,**  
New Business Project Officer, Coca-Cola FEMSA, Mexico

**Celine Herweijer,**  
Partner, PwC, United Kingdom

**Jennifer Holmgren,**  
Chief Executive Officer, LanzaTech Inc, USA

**Arthur Huang,**  
Founder and Chief Executive Officer, Miniwiz Ltd, Taiwan, China

**Glenn Hurowitz,**  
Chief Executive Officer, Mighty, USA

**Peter Lacy,**  
Global Managing Director, Growth, Strategy and Sustainability, Accenture, United Kingdom

**Jim Leape,**  
William and Eva Price Senior Fellow, Woods Institute; Co-Director, Center for Ocean Solutions, Stanford University, USA

**Li Fang,**  
Assistant Secretary-General, China Council for International Cooperation on Environment and Development, People's Republic of China

**William McDonough,**  
Adjunct Professor, Department of Civil and Environmental Engineering, Stanford University, USA

**Pan Jiahua,**  
Director, Institute for Urban and Environmental Studies, Chinese Academy of Social Sciences (CASS), People's Republic of China

**Yoshiko Shirokizawa,**  
Executive Director, Japan Science and Technology Agency (JST), Japan

**Santiago Siri,**  
Founder, Democracy Earth Foundation, USA

**Sheila Sri Prakash,**  
Chief Architect and Founder, Shilpa Architects Planners Designers Pvt. Ltd, India

**Wu Changhua,**  
Director, China and Asia, Office of Jeremy Rifkin, People's Republic of China

**Thani Ahmed Al Zeyoudi,**  
Minister of Climate Change and Environment, Ministry of Climate Change and Environment of the United Arab Emirates

### Fellow:

**Tannis Thorlakson,**  
Research Fellow, Emmett Interdisciplinary Program in Environment and Resources, Stanford University, USA

### Council Manager:

**Gaia Felber,**  
Project Specialist, Environmental Initiatives, World Economic Forum, Switzerland

# The Future of Financial and Monetary Systems

## Mandate and objectives:

Look at the future of the financial and monetary systems, comprising the following elements: evolving regulatory requirements; innovating to rebuild trust and stability in the financial system; the need for a new underlying financial system blueprint; increasing access to and use of financial services; harnessing data to benefit risk management and customer interaction; technological impact on the financial services ecosystem; and system interconnectedness and evolving market risks.

## Council outputs:

- White paper on [The Financial and Monetary System Vision 2030](#) with a unanimously agreed upon vision and contributions from council members to provide bold ideas for solving critical global, regional and industry challenges

- [Video teaser](#) for The Financial and Monetary System Vision 2030 report, including interviews with council members providing personal insights on Vision 2030, and radio podcasts with GFC members providing highlights of Vision 2030
- Two podcasts created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series:
  1. On the [Financial and Monetary Systems](#) with Cecilia Skingsley, Deputy Governor, Swedish Central Bank, and Axel Lehmann, President Personal & Corporate Banking and President, UBS Switzerland
  2. On the [Global Economy](#) with H el ene Rey, Lord Bagri Professor of Economics, London Business School



## Council Members

### Co-Chairs:

**Axel P. Lehmann,**  
President Personal & Corporate Banking and President UBS Switzerland, UBS AG, Switzerland

**Cecilia Skingsley,**  
Deputy Governor, Swedish Central Bank (Sveriges Riksbank), Sweden

### Members:

**Peggy Abkemeier Alford,**  
Chief Operating Officer, Asia-Pacific, PayPal, USA

**Erik Bergl of,**  
Professor and Director, Institute for Global Affairs, London School of Economics and Political Science, United Kingdom

**Khalid Al Bustani,**  
Director-General, Ministry of Finance of the United Arab Emirates

**Karen Fawcett,**  
Chief Executive Officer, Retail Banking; Group Head, Brand and Marketing, Standard Chartered Bank, Singapore

**Gloria Grandolini,**  
Senior Director, Finance and Markets Global Practice, The World Bank, USA

**Michael Heise,**  
Chief Economist, Economic Research and Corporate Development, Allianz SE, Germany

**Natalie Ann Jaresko,**  
Chairperson, Aspen Institute Kyiv, Ukraine

**Suzanne Nora Johnson,**  
Vice-Chair, The Brookings Institution, USA

**Adam Kansler,**  
Executive Vice-President, Financial Markets, IHS Markit, USA

**Essa Kazim,**  
Governor, Dubai International Financial Centre (DIFC), United Arab Emirates

**Steffen Kern,**  
Chief Economist and Head, Risk Analysis, European Securities and Markets Authority, France

**Alice Law Shing-Mui,**  
Managing Director, Hong Kong Mandatory Provident Fund Authority, Hong Kong SAR

**Bill Michael,**  
Senior Partner, United Kingdom; Chairman, KPMG, United Kingdom

**Min Liao,**  
Vice Minister, Ministry of Finance of the People's Republic of China

**Kari Olrud Moen,**  
Group Executive Vice-President, Strategic Projects, DNB ASA, Norway

**Olli Rehn,**  
Member of the Board, Bank of Finland/Suomen Pankki, Finland

**H el ene Rey,**  
Lord Bagri Professor of Economics, London Business School, United Kingdom

**Anne Richards,**  
Chief Executive, M&G Investments, United Kingdom

**Claudio Scardovi,**  
Managing Director, AlixPartners LLP, Italy

**Domenico Giovanni Siniscalco,**  
Vice-Chairman; Country Head, Italy; Head, Government Coverage, Europe, Middle East and Africa; Managing Director, Morgan Stanley, Italy

**Jeffrey Tessler,**  
Member of the Executive Board, Deutsche B rse AG, Luxembourg

**Siddharth Tiwari,**  
Executive Secretary, G20 Eminent Group, Singapore

**Jeromin Zettelmeyer,**  
Senior Fellow, Peterson Institute for International Economics, USA

**Zhu Min,**  
Chairman, National Institute of Financial Research, People's Republic of China

### Fellow:

**Patrick Augustin,**  
Assistant Professor of Finance, Desautels Faculty of Management, McGill University, Canada

### Council Manager:

**Elaine Smith,**  
Community Lead, Banking and Capital Markets, World Economic Forum, USA



# The Future of Food Security and Agriculture

## Mandate and objectives:

Explore the future of the system of food security and agriculture, comprising the following elements: sustainability (climate, water, land and forest management, and sustainable diets); health and nutrition (undernutrition and obesity); inclusivity (smallholder farmers, women and youth); efficiency (trade, markets and food loss and waste); and transformation (impact of the Fourth Industrial Revolution).

## Council outputs:

- Advanced collectively and individually the adoption of the food systems approach, highlighting a shift in content and language that has impactful repercussions in pursuit of the Sustainable Development Goals
- Published an [Agenda blog](#) elevating key messages and priorities on a food systems approach for global leaders at the World Economic Forum Annual Meeting in Davos

- Provided expertise and key insights to the World Economic Forum's [Innovation with a Purpose](#) report, which identified transformative innovations in food systems to scale impact for country-led action including in Africa, Asia and Latin America
- Provided expertise for the development of the white paper [Shaping the Future of Global Food Systems: A Scenarios Analysis](#) to serve as a catalyst for changing decision-making and assessed its value as a benchmark tool
- Contributed with recommendations on key topics to address through the development of a [Food Systems Dialogue](#), focusing on (a) the use of science-based targets; (b) policies and economic incentives; and (c) innovation, inclusion and monitoring



## Council Members

### Co-Chairs:

**Corinna Hawkes,**  
Professor of Food Policy; Director, Centre for Food Policy, City University London, United Kingdom

**Juergen Voegelé,**  
Senior Director, Agriculture, The World Bank, USA

### Members:

**Kees Aarts,**  
Chief Executive Officer, Protix, Netherlands

**Justin Adams,**  
Managing Director, Global Lands, The Nature Conservancy, USA

**Inger Andersen,**  
Director-General, International Union for Conservation of Nature (IUCN), Switzerland

**Pedro Antonio Arraes Pereira,**  
President, EMATER-GO (Agency for Technical Assistance and Agriculture Research of the State of Goiás), Brazil

**Tim Benton,**  
Dean for Strategic Research, University of Leeds, United Kingdom

**Mamadou Biteye,**  
Managing Director, Africa Regional Office, The Rockefeller Foundation, Kenya

**Francesco Branca,**  
Director, Nutrition for Health and Development, World Health Organization (WHO), Switzerland

**Ramesh Chand,**  
Member, National Institution for Transforming India (NITI) Aayog, India

**Ruben G. Echeverria,**  
Director General, International Center for Tropical Agriculture (CIAT), Colombia

**Shenggen Fan,**  
Director-General, International Food Policy Research Institute (IFPRI), USA

**Ajay Vir Jakhari,**  
Chairman, Bharat Krishak Samaj (Farmers' Forum India), India

**John H. Lienhard V,**  
Abdul Latif Jameel Professor of Water and Food, Massachusetts Institute of Technology (MIT), USA

**Berry J. Martin,**  
Member of the Executive Board, Rabobank Group, Netherlands

**Clare Matterson,**  
Chief Executive Officer, EAT Foundation, Norway

**Raymond C. Offenheiser,**  
Director, University of Notre Dame, USA

**Janet Ranganathan,**  
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**Jeff Seabright,**  
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**Lindiwe Majele Sibanda,**  
Vice President for Country Support, Policy and Delivery Alliance for a Green Revolution in Africa (AGRA), Kenya

**Gunhild Anker Stordalen,**  
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**Patrick Webb,**  
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**Fokko Wientjes,**  
Vice-President, Nutrition, Emerging Markets, Royal DSM NV, Netherlands

**Zhu Jing,**  
Professor; Dean, College of Economics and Management, Nanjing Agricultural University, People's Republic of China

### Council Manager:

**Maria Elena Varas,**  
Project Lead, Latin America Partnerships - Food Security and Agriculture System Initiative, World Economic Forum, USA

# The Future of Health and Healthcare

## Mandate and objectives:

Play the role of an advisory board to shape the programme of the System Initiative of Health and Healthcare, with a focus on the following areas: data and clinical analytics for improved healthcare delivery; regulatory, societal and business model innovations to advance precision medicine; strategies to influence behaviours in health and healthcare; from micro-level initiatives to macro-level policy-making; dealing effectively with non-communicable diseases; the rising global burden of mental health; and designing global response mechanisms to pandemics.

## Council outputs:

- Report on Health and Healthcare in the [Fourth Industrial Revolution](#) featuring four technology-focused themes: medical breakthroughs in biotechnology; enhancing

human health for improved wellness; analytics and computing for improved diagnostics, payments and information sharing; and modern machines and healthcare

- Podcast on [Personalized and Precision Medicine](#) with Andre Goy, Chairman and Executive Director of the John Theurer Cancer Center at Hackensack University Medical Center, created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series



## Council Members

### Co-Chairs:

**Andre Goy,**  
Chairman and Executive Director; Chief of Lymphoma, John Theurer Cancer Center, Hackensack University Medical Center, USA

**Sania Nishtar,**  
Founder and President, Heartfile, Pakistan

### Members:

**Nerio Alessandri,**  
Founder and Chairman, Technogym SpA, Italy

**Mark Britnell,**  
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**I-han Chou,**  
Senior Editor and Editorial Head of San Francisco, Nature, USA

**Mazen S. Darwazeh,**  
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**Sally Davies,**  
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**Deborah DiSanzo,**  
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**Victor Dzau,**  
President, National Academy of Medicine, USA

**Paul R. Hogan,**  
Chairman and Founder, Home Instead Inc., USA

**Jen Hyatt,**  
Founder, Troo Life Coach, United Kingdom

**Na'am Jamshed,**  
Senior Director, Government Affairs and Policy, Middle East, Johnson & Johnson, United Arab Emirates

**Khaliya,**  
Mental Health Technologist and Founder, Falkora, USA

**Birgit König,**  
Chief Executive Officer, Health Germany; Member of the Board, Allianz SE, Germany

**Bente Mikkelsen,**  
Head, Secretariat, WHO Global Coordination Mechanism (GCM/NCD), World Health Organization (WHO), Switzerland

**Yitzhak Peterburg,**  
President and Chief Executive Officer, Teva Pharmaceutical Industries Ltd, Israel

**Gianluca Pettiti,**  
President, Biosciences, Thermo Fisher Scientific Inc., USA

**Gary Phillips,**  
President and Chief Executive Officer, Orphamed, Inc., USA

**Peter Piot,**  
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**Humaid Mohammed Obaid Al Qutami,**  
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**Johanna Ralston Lamb,**  
Chief Executive Officer, World Obesity Federation, Switzerland

**Naveen Rao,**  
Lead, MSD for Mothers, MSD, USA

**Bright Simons,**  
President, MPedigree, Ghana

**Vivian Tan,**  
Vice-President, Strategy and Transformation Kaiser Permanente, USA

**Xu Qian,**  
Professor and Chairwoman, Department of Maternal and Child Health, School of Public Health, Fudan University, People's Republic of China

**Andrey Zarur,**  
Managing General Partner, Kodiak Venture Partners, USA

### Fellow:

**Tolu Oni,**  
Associate Professor, School of Public Health and Family Medicine, University of Cape Town, South Africa

### Council Manager:

**Emmanuel Akpakwu,**  
Project Lead, Value in Healthcare, World Economic Forum, Switzerland

# The Future of Human Enhancement

## Mandate and objectives:

Explore how developments in human enhancement could impact industry, governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are kept under control.

## Council outputs:

- [Survey](#) on US public perception of human enhancement technologies (with AARP Research) and a Scientific American [article](#) analysing the data of the survey
- Nature Human Behaviour article “[Rethinking Human Enhancement as Collective Welfarism](#)”, which provides a framework that captures the questions developers, entrepreneurs and tech transfer facilitators should ask themselves as they envision new human enhancement technologies

- [Ethics of Human Enhancement Tutorial](#) (audio) and [Transcript](#) by guest speakers Julian Savulescu and Anders Sandberg
- A series of publications: [Five reasons the future of brain enhancement is digital, pervasive and \(hopefully\) bright](#) by Alvaro Fernandez; [How should we regulate genome editing?](#) by Susan Pechin; [The Neurotech Revolution Could Lead To ‘Frankenstein’ Brains. Here’s How We Avoid It](#) by Daphne Bavelier, Simone Schurle, and Alvaro Fernandez; and [What Davos taught me about supporting my transgender child.](#) by Cori Lathan
- A NeurOnFire [podcast](#) with Cori Lathan on the future of human enhancement, in which she discusses the council survey

## Council Members

### Co-Chairs:

**Linda P. Fried,**  
Dean and DeLamar Professor of Public Health, Mailman School of Public Health, Columbia University, USA

**Corinna E. Lathan,**  
Chair of the Board and Chief Executive Officer, AnthroTronix Inc., USA

### Members:

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**Daphne Bavelier,**  
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**Ekaterina Bereziy,**  
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**Caroline Casey,**  
Founder, Binc, Ireland

**Alvaro Fernández Ibáñez,**  
Chief Executive Officer and Editor-in-Chief, SharpBrains, USA

**Theodore Friedmann,**  
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**Juan José Ignacio Gómez-Camacho,**  
Ambassador and Permanent Representative of Mexico to the USA, Permanent Mission of Mexico, USA

**Oliver Harrison,**  
Chief Executive Officer, Health Moonshot, Telefónica Innovation Alpha, Telefonica SA, Spain

**Ali Hilal-Alnaqbi,**  
Associate Professor of Mechanical Engineering, New York University - Abu Dhabi, United Arab Emirates

**Alexandre Kalache,**  
President, International Longevity Centre-Brazil, Brazil

**Li Yinuo, Director,**  
China Country Office, Bill & Melinda Gates Foundation, People’s Republic of China

**Jennifer Miller,**  
Founder and President of the Board, Bioethics International, USA

**Ira Pastor,**  
Chief Executive Officer, Bioquark Inc., USA

**Sue Peschin,**  
President and Chief Executive Officer, Alliance for Aging Research, USA

**Mark Pollock,**  
Collaboration Catalyst and Explorer, Mark Pollock Trust, Ireland

**Nayef Al-Rodhan,**  
Honorary Fellow, St Antony’s College, University of Oxford, United Kingdom

**Yoshiyuki Sankai,**  
Chief Executive Officer and President, CYBERDYNE, INC., Japan

**Daljit Singh,**  
President, Fortis Healthcare Limited, India

**Debra Whitman,**  
Chief Public Policy Officer, AARP, USA

**Derek Yach,**  
Founder; President-Designate, Foundation for a Smoke-Free World, USA

### Fellow:

**Simone Schuerle,**  
Head, Responsive Biomedical Systems Laboratory, Institute of Translational Medicine; Branco Weiss Fellow, ETH Zurich, Switzerland

### Council Manager:

**Marina Krommenacker,**  
Community Lead, Global Health and Healthcare Industries, World Economic Forum, Switzerland



# The Future of Human Rights

## Mandate and objectives:

Explore what the impact of the Fourth Industrial Revolution on human rights might be, and draft recommendations on how to create the appropriate governance structures to ensure that technological development and use does not put universal human rights in danger. More specifically, identify: How can the human rights discourse shape the Fourth Industrial Revolution and technological advances? How can we govern Human Rights in the Fourth Industrial Revolution? How are rights changing/evolving through the Fourth Industrial Revolution? How will human rights look like in the future in relation to the internet, privacy, and access to technology? How can we protect traditional human rights in the era of the Fourth Industrial Revolution?

## Council outputs:

- White paper [How to Prevent Discriminatory Outcomes in Machine Learning](#) offers a framework for understanding the potential risks for machine-learning applications to arrive at a roadmap for preventing them. This is based

on the rights enshrined in the Universal Declaration of Human Rights and further elaborated in a dozen binding international treaties that provide substantive legal standards for the protection and respect of human rights and safeguarding against discrimination

- Contribution from Hilary Sutcliffe and Anne-Marie Allgrove to the book [Shaping the Fourth Industrial Revolution](#). The section entitled “A Human Rights-based Framework” aimed to highlight the applicability of the Universal Declaration of Human Rights when developing standards for emerging technologies
- Podcast on [Human Rights](#) with Erica Kochi, Co-Founder of UNICEF Innovation, and Mike Posner, Jerome Kohlberg Professor of Ethics and Finance of the Stern School of Business and Director of the Center for Business and Human Rights at New York University; created as part of the World Economic Forum’s [A Glimpse into the Future](#) podcast series

## Council Members

### Co-Chairs:

**Erica Kochi,**  
Co-Founder, UNICEF Innovation, United Nations Children’s Fund (UNICEF), USA

**Michael H. Posner,**  
Jerome Kohlberg Professor of Ethics and Finance; Director, Center for Business and Human Rights, Stern School of Business, New York University, USA

### Members:

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**Michelle Arevalo-Carpenter,**  
Chief Executive Officer, IMPAQTO, Ecuador

**Daniel Bross,**  
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**Amal Clooney,**  
Barrister, Doughty Street Chambers, United Kingdom

**Steven Crown,**  
Vice-President and Deputy General Counsel, Microsoft Corp., USA

**Eileen Donahoe,**  
Executive Director, Global Digital Policy Incubator, USA

**Sherif Elsayed-Ali,**  
Director of Global Issues, Amnesty International, United Kingdom

**Isabelle Falque-Pierrotin,**  
President, Commission Nationale de l’information et des libertés (CNIL), France

**Damiano de Felice,**  
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**Samuel Gregory,**  
Programme Director, WITNESS, USA

**May-Ann Lim,**  
Executive Director, Asia Cloud Computing Association, Singapore

**Katherine Maher,**  
Executive Director, Wikimedia Foundation Inc., USA

**Marcela Manubens,**  
Global Vice-President, Integrated Social Sustainability, Unilever, United Kingdom

**Andrew McLaughlin,**  
Co-Founder and Partner, Higher Ground Labs, USA

**Mayur Patel,**  
Executive Vice-President, Strategy and Corporate Development, Econet Media, South Africa

**Esra’a Al Shafei,**  
Founder and Executive Director, Mideast Youth, Bahrain

**Hilary Sutcliffe,**  
Director, SocietyInside, United Kingdom

**Manuela M. Veloso,**  
Herbert A. Simon University Professor, School of Computer Science, Carnegie Mellon University, USA

### Fellow:

**Miles Jackson,**  
Associate Professor of Law, University of Oxford, United Kingdom

### Council Managers:

**Lisa Ventura,**  
Community Lead, Civil Society, World Economic Forum, Switzerland

**Silvia Magnoni,**  
Head of Civil Society Communities, World Economic Forum, Switzerland



# The Future of Information and Entertainment

## Mandate and objectives:

Advise and guide the information and entertainment system on “the day after tomorrow” thinking, which are ideas, regulations and policies, business models, concepts and technologies that have the potential to revolutionize the system. The key system challenges that require “day after tomorrow” thinking include: increased accountability for accuracy and validity of content; growing tensions between personalized service and industry’s use of personal data; technological innovations that may impact various industry sectors; transformations in human behaviour and in society from hyperconnectivity; an increasingly congested content ecosystem of creation, distribution and consumption; difficulties in accessing, managing and monetizing intellectual property; end-user empowerment, including freedom of expression, control of digital identities and instilling a sense of global citizenship; and insufficient legal, regulatory, technical and human capital-related infrastructure for growing and sustaining creative economies.

## Council outputs:

- Co-development of a project proposal for a Centre of Global Storytelling, which involves inter-council coalition building
- Forum Agenda blog “[Storytelling can be a force for social change. Here’s how](#)”, which presents examples and case studies on the positive use of narrative in media for social good
- The council’s mis/disinformation working group collected and provided evidence on digital misinformation strategies to the UK House of Lords’ Select Committee on Political Polling and Digital Media. Some inputs already submitted to the public inquiry. The group’s inputs were published in the [Committee’s Report of Session 2017-2019](#)

## Council Members

### Co-Chairs:

**Kerstin Jorna,**  
Deputy Director-General, Economic and Financial Affairs,  
European Commission, Belgium

**Manuel Rivera,**  
Vice-President, Grupo 5M, Mexico

### Members:

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Director, Communications, Mayo Clinic, USA

**Abdulrahman Addas,**  
Chief Corporate Development Officer, Majid Al Futtaim  
Holding, United Arab Emirates

**Pallavi S. Aiyar,**  
Japan Correspondent, The Hindu, Japan

**Enrique Avogadro,**  
Secretary of Culture and Creativity, Ministry of Culture,  
Argentina

**Amadou Mahtar Ba,**  
Co-Founder and Executive Chairman,  
AllAfrica Global Media, USA

**Nicholas Baughan,**  
Chief Executive Officer, Maxus, United Kingdom

**Chan Yuen-Ying,**  
Honorary Professor, Technology-Enabled Learning Initiative,  
University of Hong Kong, Hong Kong SAR

**Elizabeth Daley,**  
Dean, School of Cinematic Arts,  
University of Southern California (USC), USA

**Florian Drücke,**  
Chairman and Chief Executive Officer,  
Bundesverband Musikindustrie e.V., Germany

**Sylvie Forbin,**  
Deputy Director-General, Copyright and Creative Industries  
Sector, World Intellectual Property Organization (WIPO),  
Switzerland

**Brian Forde,**  
Senior Lecturer, Sloan School of Management,  
Massachusetts Institute of Technology (MIT), USA

**Jacques-Edouard Guillemot,**  
Senior Vice-President, Executive Affairs,  
Kudelski Group, Switzerland

**Shigeru Ishida,**  
Executive Officer, Dentsu Inc., Japan

**Garth C. Japhet,**  
Founder and Chief Executive Officer, Heartlines, South Africa

**Noura bint Mohammed Al Kaabi,**  
Minister of State for Culture and Knowledge Development,  
Ministry of Community Development, United Arab Emirates

**Mona Al Marri, Director-General,**  
Government of Dubai Media Office, United Arab Emirates

**Raju Nariseti,**  
Chief Executive Officer, Gizmodo Media Group, USA

**Jonathan Perelman,**  
Head of Digital, ICM Partners Inc., USA

**Gerrit Schumann,**  
Chief Digital Officer, Verlagsgruppe Handelsblatt  
GmbH & Co. KG, Germany

**Aaron H. Sherinian,**  
Communications Director,  
The Aga Khan Development Network, France

**Kan Hiroshi Suzuki,**  
Special Adviser and Chief Policy Officer to the Minister  
of Education, Culture, Sports, Science and Technology,  
Ministry of Education, Culture, Sports,  
Science and Technology of Japan

**Farida Vis,**  
Professor, Digital Media, Manchester School of Art,  
United Kingdom

**Claire Wardle,**  
Executive Director, First Draft News Inc., USA

**Tania Yuki,**  
Founder and Chief Executive Officer, Shareablee, USA

### Fellow:

**Tanya Filer,**  
Research Associate in Public Policy and Policy Engagement,  
Cambridge Institute for Public Policy,  
University of Cambridge, United Kingdom

### Council Manager:

**Claudio Cocorocchia,**  
Acting Head of Information and Entertainment System  
Initiative, Global Leadership Fellow,  
World Economic Forum, Switzerland



# The Future of Innovation and Entrepreneurship

## Mandate and objectives:

Explore the Fourth Industrial Revolution as an opportunity to change models of innovation-driven entrepreneurship for the better, and create an environment that makes entrepreneurship more inclusive, while maximizing the Fourth Industrial Revolution's benefits to the society and minimizing the risks that come with it.

## Council outputs:

- Two podcasts created as part of the World Economic Forum's [A Glimpse into the Future podcast series](#):
  1. [Innovation and Entrepreneurship](#) with Geoff Mulgan, Chief Executive of NESTA

2. [Global Digital Evolution](#) with Bhaskar Chakravorti, Senior Associate Dean at the Fletcher School of Law and Diplomacy, Tufts University

- Series of Agenda blogs, including “[5 ways policy could close the gender gap in entrepreneurship](#)” by David Halabisky; “[10 ways governments can better keep up with fast-changing industries](#)” by Geoff Mulgan; and “[To train tomorrow's leaders, universities need to teach universal skillsets](#)” by R. May Lee, Mark Kendall and Tom Simmons
- An executive brief to one of the presidential candidates of Colombia on his innovation agenda

## Council Members

### Co-Chairs:

**Neelie Kroes,**  
Non-Executive Member of the Board, Open Data Institute, United Kingdom

**Geoff Mulgan,**  
Chief Executive, Nesta, United Kingdom

### Members:

**Valerie Casey,**  
Founder and Executive Director, The Designers Accord, USA

**Bhaskar Chakravorti,**  
Senior Associate Dean, The Fletcher School of Law and Diplomacy, Tufts University, USA

**Chen Hongbo,**  
Vice-Dean, Tuspark Research Institute for Innovation, Tsinghua University, People's Republic of China

**Rocio Fonseca,**  
Executive Director, Start-Up Chile, Chile

**Tracy De Groose,**  
Chief Executive Officer, Dentsu Aegis Network Ltd, United Kingdom

**David Halabisky,**  
Economist, Organisation for Economic Co-operation and Development (OECD), France

**Huda Al Hashimi,**  
Assistant Director-General, Strategy and Innovation, Office of the Prime Minister of the United Arab Emirates, United Arab Emirates

**Susan Hauser,**  
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**Victor Hwang,**  
Vice-President, Entrepreneurship, Ewing Marion Kauffman Foundation, USA

**Wong Poh Kam,**  
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**Eugene Kandel,**  
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**Mark Kendall,**  
Chairman, Innovation Champions, The University of Queensland, Australia

**R. May Lee,**  
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Global Head, Telecom Media Technology, Venture Capital and Funds, International Finance Corporation (IFC), USA

**Ovais Naqvi,**  
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**Catalina Ortiz,**  
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**Navi Radjou,**  
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**Allon Raiz,**  
Chief Executive Officer, Raizcorp, South Africa

**Ashish J. Thakkar,**  
Founder, Mara Group, Dubai

**Peter Tufano,**  
Dean, Said Business School, University of Oxford, United Kingdom

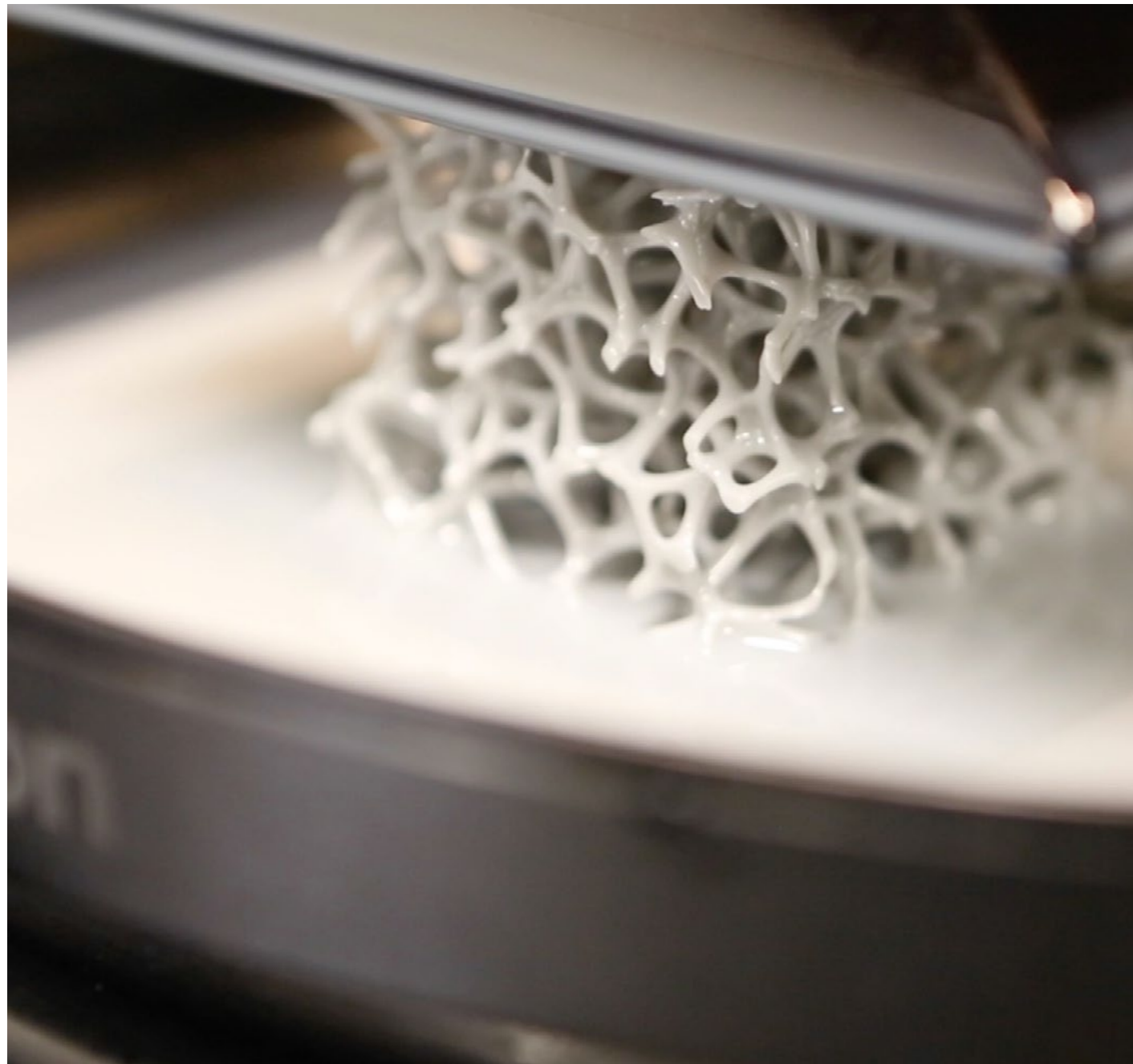
**Jeffrey Wong,**  
Global Chief Innovation Officer, EY, USA

### Fellow:

**Tom Simmons,**  
Enterprise Fellow, University of Cambridge, United Kingdom

### Council Managers:

**Manju George,**  
Head of Platform Services and Public-Private Cooperation, World Economic Forum, Switzerland



# The Future of International Governance, Public-Private Cooperation and Sustainable Development

## Mandate and objectives:

Promote, syndicate and discuss latest trends, technologies and solutions at the nexus of public-private cooperation and sustainable development delivery against the 2030 Agenda. This includes the role of multistakeholder partnerships to address the global challenges of sustainable development; the role of international organizations in global decision-making; and transnational expert networks providing an alternative to intergovernmental coordination.

## Council outputs:

- Launched the [Fourth Sector Development Initiative](#) as a project under the World Economic Forum System Initiative on Shaping the Future of Economic Progress, which aims to create an enabling environment for “for-

benefit” companies (for-profit companies that have social and environmental sustainability embedded in their modus operandi)

- Mapped and organized the World Economic Forum’s work on the Sustainable Development Goals, conducting a gap analysis and a communication enhancement, which fed into the programme of the World Economic Forum’s Sustainable Development Impact Summit 2018
- Podcast on [Sustainable Development](#) with Charlotte Petri Gornitzka, Chair of the Development Assistance Committee at the Organisation for Economic Co-operation and Development, created as part of the World Economic Forum’s [A Glimpse into the Future](#) podcast series



## Council Members

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**Alex Mung,**  
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# The Future of International Security

## Mandate and objectives:

Focus on the future of the international security system highlighting three dimensions. First, strategic stability: how can technological capabilities maintain stability and promote a better level of international security as a global common good? What will improve mutual understanding and transparency, reducing the risks of miscalculation? Can we shape a future where technology favours the defensive and deters aggression? Second, a shift in the public-private balance: enabling technology for the Fourth Industrial Revolution originates and circulates mainly in the private sector, increasing scope for “dual-purpose” technologies. How will this affect arms control, proliferation and the balance of power between state actors and non-state actors? And third, new domains: powerful, cheap and accessible technology lowers entry barriers to domains like cyber, space and the ocean depths. Where regimes of governance lag, security actors are tempted to explore new courses of action and arms races. How will this reorder security governance priorities?

## Council outputs:

- A [final report](#) which includes an analytical element that comes out of a scenarios exercise, a mapping element on actors, and a visioning element from a mapping exercise about the geopolitical world in 2030
- Session at the World Economic Forum Annual Meeting 2018 on [The Geopolitical Map](#) in which interactive maps and data visualizations brought to life the historical trends and emerging geographic patterns behind the world’s pressing challenges
- Podcast on [International Security](#) with Shirley Ann Jackson, President of the Rensselaer Polytechnic Institute, and Espen Barth Eide, Member of the Norwegian Parliament; created as part of the World Economic Forum’s [A Glimpse into the Future podcast series](#)

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# The Future of International Trade and Investment

## Mandate and objectives:

Explore the future of the international trade and investment system and provide thought leadership to high-level policy fora such as the G20 and Asia Pacific Economic Forum (APEC). Focus areas include international trade as a vehicle for sustainable development; the role of investment, trade and competition policies in regional integration processes; and the digital economy and its impact on economic growth and inclusiveness.

## Council outputs:

– Six high-level strategic briefs on tensions and opportunities in global trade governance:

1. **Four Scenarios for the Future of Trade and Investment:** Amid growing discontent over globalization, the outlook for trade cooperation is darkening, with implications for economic growth, peace and stability. The council diagnoses the challenges and outlines three scenarios for how the future could unfold
2. **Strategic Brief for the G20 Summit in Hamburg, Germany:** The legitimacy of international trade and investment rules is under question. The council debates how to maintain continuity of current frameworks while ensuring trade benefits are shared more widely
3. **Strategic Brief for Trade Ministers on Creating an Inclusive Trade Agenda:** Some stakeholders have expressed concern over the potential impacts of trade opening on vulnerable members of society. Critics question the degree of inclusiveness that trade can promote. The council presents options for pursuing more inclusive trade policies
4. **Strategic Brief for Trade Ministers on the WTO Dispute Settlement Mechanism:** The council provides context on the history of the WTO Dispute Settlement

Body, the commercial value it has provided, the challenges facing the system, and encourages countries to remain engaged in finding solutions for current tensions

5. **Strategic Brief on Misconceptions around Trade Balances:** The council examines the economics behind trade deficits and trade surpluses and how these may impact production and economic growth
  6. **Strategic Brief on Trade Rules for the Global Tech Race:** The council explores the frameworks needed to ensure continued innovation and competition in a globally connected digital economy
- The council offered thought leadership to the Forum's Trade and Investment System Initiative **Global Value Chains Platform** project
  - Council members contributed to a series of Agenda trade-focused blogs, including "There's a new global technology race. It needs better trade rules" by Anabel Gonzalez; "Here's why it's time to ditch our obsession with trade deficits" by Arancha González Laya; "Brexit, the US, China and the future of global trade" by Anabel Gonzalez; "This is why women must play a greater role in the global economy" by David Abney and Arancha González Laya; "These are the lessons we can learn for the future of Aid-for-Trade" by Anabel Gonzalez; "5 reasons not to give up on global trade" by Arancha González Laya and Peter Draper; "As Western economies look inward, what's the future for Latin American trade?" by Arancha González Laya; "3 challenges Latin American economies must overcome to boost intraregional trade" by Anabel Gonzalez; and "Trade can help us create a better society for all - if we use it properly" by Arancha González Laya
  - The council reviewed and enabled the curation of the **International Trade and Investment Transformation Map**. A podcast by the GFC Co-Chairs is available as an introduction (see "listen to overview")

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# The Future of Long-Term Investing, Infrastructure and Development

## Mandate and objectives:

Explore the future of the long-term investing, infrastructure and development system, comprising the following elements: access to finance for modernizing infrastructure; identifying best practices in operation and maintenance; lack of knowledge and collaboration in global infrastructure delivery; misaligned incentives in terms of infrastructure investment; clarity on infrastructure projects' life-cycle; and understanding the global risk landscape.

## Council outputs:

- Article “We Built Major Railroads In The U.S. Last Century. How Can We Build Such Infrastructure Again?” In Forbes Magazine, May 2018
- Report on [Improving Infrastructure Financing in Brazil](#) in collaboration with the Inter-American Development Bank

- Incubation of the [Africa Infrastructure Fellowship Programme](#) in collaboration with the G20 Global Infrastructure Hub, Meridiam and the French government
- White paper on [Managing Investment Risk for the Long Term: Insights on practitioner progress beyond short-term financial considerations](#), which explores investor practices that support long-term and inclusive business strategies (complementary to the work on the Compact for Responsive and Responsible Leadership). By illustrating three case studies of global institutional investors, the white paper highlights how productive engagement is a crucial part of strategic decision making to improve long-term outcomes and create long-term value



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# The Future of Migration

## Mandate and objectives:

Explore the future of the system of migration, comprising the following elements: increasingly complex consequences of population displacement and unclear responsibilities; economic migration increasingly shifting the geography of prosperity; climate change contributing to the increasing prevalence of environmental refugees; growing prevalence of cross-border commuting; and increasing global competition for talent and skilled workers.

## Council outputs:

- A compilation of best practices and guidelines on how to engage the private sector on migration, shared at the World Economic Forum's Sustainable Development Impact Summit
- A partnership with the International Organization for Migration to promote leading research on migration
- Multiple contributions to the Agenda, Huffington Post and other media outlets on cutting-edge migration topics, such as good governance and migration,

the impact on the Fourth Industrial Revolution on migration, refugee integration, etc. Agenda blogs include “A solution to migration and employment issues in Africa? Remote working” by Tolu Olubunmi and Rajeeb Dey; “What does the Fourth Industrial Revolution mean for migration?” by Richard Eldridge, Khalid Koser, Mariah Levin and Sanjiv Rai; and “Voting with their feet? Why young Africans are choosing migration over the ballot box” by Richard Danziger

- A concept note and guidelines for creating a common African talent mobility agenda
- Multiple sessions at World Economic Forum regional and annual meetings on migration, in partnership with the Global Programming Group
- Podcast on [Migration](#) with Khalid Koser, Executive Director of the Global Community Engagement and Resilience Fund; Ratna Omidvar, Senator of Canada; and Yasmina Filali, Founder and President of the Fondation Orient Occident; created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series

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# The Future of Mobility

## Mandate and objectives:

Support the future of the mobility system by future-proofing the vision for system leadership within and across different areas, shaping the Fourth Industrial Revolution with a focus on governance, and putting these global transformations in regional/national contexts to inform policy-making. Also, explore transformational elements of the system, such as the need for updated regulatory frameworks, technology impact on business models, energy efficiency and conservation, urbanization trends and smart cities, industry shift towards sustainability, the lack of financing for modern infrastructure as well as of appropriately skilled human capital, access to basic services and infrastructure, changing safety and security risks and the access to finance.

## Council outputs:

- Four “future briefings” that relate to each project of the World Economic Forum System Initiative on Shaping the Future of Mobility, identifying additional areas that need to be addressed in the future (autonomous vehicles; travel and security risks; sustainability of financing different transport modes; and drones use)
- A future briefing containing visions, transformations and recommendations for the future of mobility (i.e. future’s triangle, revised [Transformation Map](#), causal layered analysis, potential future scenarios, main thrusts for mobility under the Fourth Industrial Revolution)
- An editorial plan for thought leadership contributions
- The identifying of suitable projects that can be taken from outside organizations on to the Forum’s platforms



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# The Future of Neurotechnologies and Brain Science

## Mandate and objectives:

Explore how developments in neurotechnologies and brain science could impact industry, governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are kept under control.

## Council outputs:

- The creation of global neuro labs in developing countries that provide low-cost EG lab services. Policy recommendations based on the experience of setting up these labs
- A framework to identify five to seven major gaps in mental health the Forum can take on through the System Initiative on Shaping the Future of Health and Healthcare

– Three podcasts created as part of the World Economic Forum's *A Glimpse into the Future* podcast series:

1. **Brian Sciences** with Murali Doraiswamy, Professor, Duke Institute for Brain Sciences
2. **Neurotechnology** with Tan Le, Founder and Chief Executive Officer of EMOTIV Inc.
3. **Neuroeconomics and New Neurotechnologies** with Michael Platt, Professor of Neuroscience at the Wharton School, University of Pennsylvania; Nitish Thakor, Director of the Singapore Institute for Neurotechnology, National University of Singapore; and Neal Kassell, Chairman of the Focused Ultrasound Foundation



## Council Members

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# The Future of Production

## Mandate and objectives:

Explore the future of production systems, taking a wide-ranging, holistic view. This entails assessing the impact of emerging technologies and innovation on value chains, examining the future of jobs in manufacturing and the need for an upgraded skillset, and investigating ways to promote environmental sustainability and new approaches to sustainable production. Such efforts require exploration of governance structures and regulations to enable innovation and future production, the role of trade and capital flows in future production systems and their impact on the global economy, and ongoing changes in consumer behaviour and influence on new approaches to production. In addition, due consideration will be given to the challenges for small and medium enterprises to stay relevant in future value chains, and new opportunities for public-private collaboration within the production space.

## Council outputs:

- Insight report [The Readiness for the Future of Production Report 2018](#), developed in collaboration with A.T. Kearney, analyses and presents the results of the first edition of the Readiness for the Future of Production Assessment, which measures how well-positioned 100 countries and economies are to shape and benefit from the changing nature of production to the adoption of emerging technology. It serves as a new benchmarking and diagnostic tool to catalyse multistakeholder dialogue, shape joint actions and inform the development of modern industrial strategies
- Contributed significantly to the model and content of the [new framework for readiness](#) for the future of production at national level, launched at the Annual Meeting 2018

- A network map of the system including stakeholders, core issues and interlinkages
- Expert contributions on key tension points in the production system, including technology adoption, government short-termism, new business models
- Vision of the production system in 2030 to be solution-driven, hyperconnected, people-centred, inclusive, sustainable and commercially viable
- Co-curation of the [Advanced Manufacturing and Production Transformation Map](#): breakthroughs in mobile connectivity, the internet of things, artificial intelligence, robotics, 3D printing, and advanced materials promise to transform manufacturing and production systems – impacting the way businesses operate and hire and the degree to which countries can expand their economies sustainably
- Two podcasts created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series:
  1. [Future of Production](#) with Torbjørn Netland, Chair of Production and Operations Management at ETH Zurich
  2. [Digital Transformation in Manufacturing Supply Chains](#) with Jagjit Singh Srail, Head, Centre for International Manufacturing, Institute for Manufacturing at the University of Cambridge
- Series of Agenda blogs, including [“The future of competitiveness is open”](#) by Torbjørn Netland; [“How emerging economies can take advantage of the Fourth Industrial Revolution”](#) by John Mathews and Keun Lee; and [“The digital supply chain revolution: A mountain worth climbing?”](#) by Jagjit Singh Srail

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**Francisco Betti**,  
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# The Future of Space Technologies

## Mandate and objectives:

Explore how developments in space technologies could impact industry, governments and society in the future, and design innovative governance models that ensure that their benefits are maximized and the associated risks are kept under control.

## Council outputs:

- Created the Space Sustainability Rating (SSR) framework, a new mechanism for supporting sustainable development and execution of space missions. The objective of the rating is to safeguard the long-term sustainability of Earth orbits by increasing transparency of the debris-mitigation efforts of different actors as well as creating market pressure to improve approaches. The SSR was moved into the development phase by the World Economic Forum together with several external partners

- Podcast on [Space Innovation](#) with Ellen Stofan, Professor at the Hazard Research Centre, University College London, created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series
- A series of Agenda blogs, including [“Where will space technology take us by 2030, and what does this mean for life on Earth?”](#) by George Whitesides; [“Countdown: What will 2030’s new space economy look like?”](#) by Ellen Stofan and George Whitesides; [“Space technology is improving our lives and making the world a better place. Here’s how”](#) by William Marshall; [“Why the new space race must focus on sustainability”](#) by Brian Weeden; and [“How satellite surveillance is hauling in illegal fishers”](#) by Jeffrey Tarr and William Marshall

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# The Future of Technology, Values and Policy

## Mandate and objectives:

Focus on how values that represent the global public interest can be embedded in technological systems, and how agile governance mechanisms can be constituted and implemented to address the regulatory issues surrounding emerging technologies.

## Council outputs:

- Podcast on [Technology, Values and Policy](#) with Wendell Wallach, Scholar at the Interdisciplinary Center for Bioethics at Yale University; created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series
- Designing a new social contract. [Reference Publication](#) by Stewart Wallis
- Defining agile regulatory schemes and the use of emerging technologies for justice ([Gillian Hadfield's work](#) and [Sam Muller's at HiIL](#))



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**Ngairé Woods,**  
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# The Future of the Humanitarian System

## Mandate and objectives:

Explore the future of the humanitarian system, comprising the following elements: building self-reliance for the most vulnerable in host countries; identifying new types of innovative financing mechanisms to deliver financial support; enabling technologies of the Fourth Industrial Revolution to accelerate innovation, efficiency and knowledge flows; creating new mechanisms for aid coordination; and dealing with accountability and corruption.

## Council outputs:

- Development of the World Economic Forum’s Humanitarian Agenda and its two tracks. First, Humanitarian Investing, a work stream incubated during a workshop on innovative humanitarian financing and multilateral solutions at the Annual Meeting 2018. A soft launch of the Humanitarian Investing Initiative was organized at the World Economic Forum’s Sustainable Development Impact Summit 2018. And second, the Digital Transformation of the Humanitarian System with a report prepared on designing a digitally enabled ecosystem for the humanitarian sector
- Co-organized with ODI, a session on “Financing Peace: What more can be done?” during the World Bank’s Fragility Forum in March 2018. The session leveraged the findings from the November 2017 workshop on innovative humanitarian financing
- Under its Humanitarian Finance work stream and with support from ODI, organized a workshop in November 2017 on “[Market-based solutions and innovative finance](#):

[New approaches to addressing humanitarian needs](#)” to achieve a better understanding of the opportunities and challenges related to innovative finance as tools to prevent, mitigate and increase resilience in humanitarian settings

- The council, under its data work stream, organized a workshop on “Building Public-Private Partnerships for Humanitarian Data Sharing” in September 2017 to advance perspectives on how to more effectively enable trustworthy data flows for use for humanitarian purposes
- The council, with strong support from OCHA and other UN agencies, organized a full-day Exchange Journey in Jordan ahead of the World Economic Forum on the Middle East and North Africa 2017. Participants, who included Forum Members, Partners and council members, learned about Jordan’s efforts in responding to the refugee situation and explored possible areas where the Forum communities can support those efforts. The trip entailed a visit to the Zadari and Azraq refugee camps, Jordan’s Special Economic Zone, meetings with relevant authorities as well as presentations of innovative solutions and interactions with refugees living in the camp
- Special edition of the Agenda Weekly Expert Edition newsletter on humanitarian issues, guest-edited by the council’s co-chair Tara Nathan, August 2017
- Podcast on the [Humanitarian System](#) with Peter Maurer, President of the International Committee of the Red Cross; created as part of the World Economic Forum’s [A Glimpse into the Future](#) podcast series

## Council Members

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# The Future of Behavioural Sciences

## Mandate and objectives:

Explore how the concepts of behavioural sciences can help to create the necessary environment that will maximize the Fourth Industrial Revolution's benefits to society and minimize the associated risks.

## Council outputs:

- A series of short films that explain how you can use behavioural science for health outcomes and for gender diversity and inclusion; targeted both at businesses and policy-makers
- Podcast on [Behavioural Sciences](#) with Iris Bohnet, Director of the Women and Public Policy Program at the Harvard Kennedy School of Government, and Professor Robert J. Shiller, Nobel Laureate and a Sterling Professor of Economics at Yale University; created as part of the World Economic Forum's [A Glimpse into the Future](#) podcast series



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# The Future of Platforms and Systems

## Mandate and objectives:

Explore how the concepts of systems leadership and the platform economy can help to create the necessary environment that maximizes the Fourth Industrial Revolution's benefits to society and minimizes the risks that come with it.

## Council outputs:

- White paper on systems leadership and platforms, exploring how to mobilize people to transform systems and build the platforms to scale these efforts, integrating insights from successful system leaders

- A series of case studies profiling successful system initiatives
- A series of blogs, including: “What are platforms and systems, and why are they so important?” by John Hagel; “Achieving Greater Impact through Systems and Platforms” by John Hagel and Gemma Mortensen; “Intervene, don't overthink – the new mantra of systems design” by Tim Brown; and “How do we build new systems to create the future we want and change the systems that are taking us towards a future we fear” by John Hagel and Gemma Mortensen
- An essay on Facilitating Transformative system change – realizing the world we want in 2030 published as part of the Annual Meeting of the Global Future Councils 2017

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# The Future of Regional Governance

## Mandate and objectives:

Explore the future of the system of regional governance, providing recommendations on how to improve decision-making and cooperation at a regional level, to support governance structures and tackle both regional and global challenges.

## Council outputs:

- Contributed to the World Economic Forum's regional summit programming



## Council Members

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