

CERAWEEK<sup>®</sup> 40<sup>th</sup>  
by S&P Global

innovation  
agora

# Pace of Change: Energy, Climate, and Innovation

Innovation Agora in review  
March 7-11, 2022 | Houston, Texas

[ceraweek.com](https://ceraweek.com)



# Welcome to the Innovation Agora @ CERAWeek!

At the sixth edition of the Innovation Agora @ CERAWeek, we brought together in one place a remarkable community of technologists, startup entrepreneurs, VCs and investors, thought leaders, policy makers, and corporate innovators—all dedicated to creating solutions to the greatest challenges facing our energy and environmental future.

Our focus is on advancing transformational technologies—ranging from renewables and e-mobility to CCS, advanced nuclear, digitalization, AI, quantum computing, robotics, drones, blockchain, additive manufacture, smart cities of the future, and more.

The Agora is a vibrant marketplace of ideas on energy innovation, emerging technologies, and solutions—with opportunities to learn, connect, and ideate.

Our formats include:

- **Agora Studios** — highly interactive discussions on emerging and disruptive technologies and models of innovation
- **Voices of Innovation** — journeys and insights by pioneers and thought leaders
- **Agora Pods** — deep-dive presentations, case studies, and start-up “pitches” in a close-up, relaxed setting
- **Agora Houses** — a glimpse of what’s ahead by the world’s preeminent energy and technology companies. Houses offer remarkable experiences and connections
- **Agora Café** — perfect place to meet and exchange ideas over locally roasted coffee
- **Meetups** — small, informal gatherings for discussion around common interests led by S&P Global analysts and Partners
- **Hubs** — NEW FOR 2022! Dedicated Hydrogen and Carbon Management areas featuring interactive presentations and discussions, meet-ups, receptions, and more
- **Learning Lyceum** — high-impact learning and engagement with experts
  - **Lyceum Labs** — seminars on key topics and technologies
  - **Lyceum Workshops** — group exploration of a specific challenge
- **Book signings...** and more!

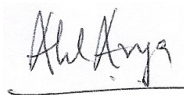
We thank all the Agora contributors—and especially our Agora Partners for their leadership commitment to our mission—and to the innovation community. They are what makes the Agora possible.

Sincerely,



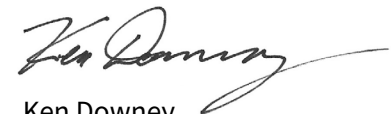
Jamey Rosenfield

Senior Vice President, S&P Global  
Agora Instigator



Atul Arya

Chief Energy Strategist, S&P Global  
Agora Program Mastermind



Ken Downey

Executive Director, S&P Global  
Agora Producer and Up Builder

# Innovation Agora @ CERAWeek Highlights



**350+**  
Sessions



**300+**  
speakers



**34**  
Partners



**60+**  
Agora Studios



**100+**  
Startups



**7**  
Agora Houses



**13**  
Voices of Innovation



**1**  
Venture Day



**130**  
Pods



**10**  
Meetups



**60**  
Hubs



**40+**  
Lyceum Labs/Workshops



**8**  
Book Signings

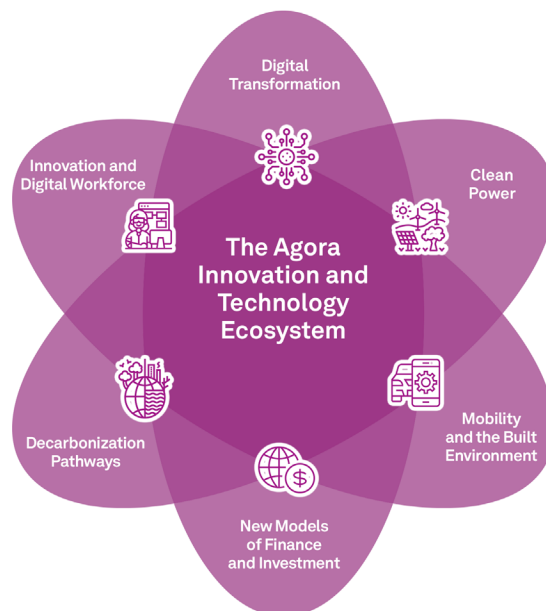
# Themes

The Innovation Agora @ CERAWeek fosters energy innovation and advances solutions to the world's greatest energy and sustainability challenges. The Agora is a marketplace for ideas, dialogue, new experiences, and connections. This exciting community of startups, technologists, investors, academics, energy companies, and government officials are all dedicated to shared learning and exploration.

The program features unique formats, interactive dialogue, and conversations about the global energy innovation and technology ecosystem.

Key themes and technology pathways featured across the Agora are rooted in innovation and energy transition solutions:

- Decarbonization Pathways
- Clean Power and Hydrogen
- Mobility and the Built Environment
- New Models of Finance and Investment
- Digital Transformation
- Innovation and Digital Workforce
- Innovation and Digital Workforce



Please take advantage of the many opportunities for engagement and learning that the Agora offers. We look forward to your contributions and ideas as together we discover new solutions and pathways for the energy future.

# Theme: Decarbonization Pathways

## Topics included

- Carbon Capture, Utilization and Storage (CCUS)
- Nature-based Solutions
- Adaptation and Physical Risk
- Emissions Measurement Technologies
- Sustainability, Resiliency and Preparedness
- Low-carbon Initiatives
- Decarbonizing the Industrial Sector
- Emissions Abatement Technologies



Chris Romer, Chief Executive Officer, Project Canary



Robert Zeller, Vice President, Low Carbon Ventures, Oxy



Decarbonization Challenges & Technology Pathways with Glen Donovan, Vice President, Development, Semptra, and Gwenaëlle Avice-Huet, Chief Strategy & Sustainability Officer and Member of the Schneider Electric Executive Committee, Schneider Electric

# Theme: Clean Power and Hydrogen

## Topics included

- Hydrogen, Sustainable Gas, and Biofuels
- Big Data and Predictive Analytics
- Battery Storage Technologies
- Next Generation Solar and Wind
- Advanced Nuclear (SMR) Technology
- Microgrids and Grid Integration
- Fusion Generation
- New Energy Supply Chain
- Emerging Renewable Technologies



**Developing the Hydrogen Value Chain with Alex Klaessig** (Chair), Senior Director, Hydrogen and Renewable Gas Forum, S&P Global; **Bill Newsom**, President & Chief Executive Officer, Mitsubishi Power Americas; and **Ricky Sakai**, Vice President New Business Development, Mitsubishi Heavy Industries America



**Jonah Margulis**, Head of North American Operations, Aker Offshore Wind



**Bruno Roche**, Global Head of Energy Transition, ABB Energy Industries



**Katherine Anne Rojas**, Director of Marketing Production Systems Division, Schlumberger



**John Berger**, Chairman, President & CEO, Sunnova Energy International



# Theme: Mobility and the Built Environment

## Topics included

- Future of Autonomous Vehicles
- EVs – Adoption, Charging, and Batteries
- Electrification Beyond Passenger Cars
- Energy Efficient Buildings
- Autonomous Vehicles Technologies
- 5G, Connected Cars, and Mobility Technologies
- Cities and Urban Centers of the Future
- The New Future of Mobility
- The Innovative Built Environment



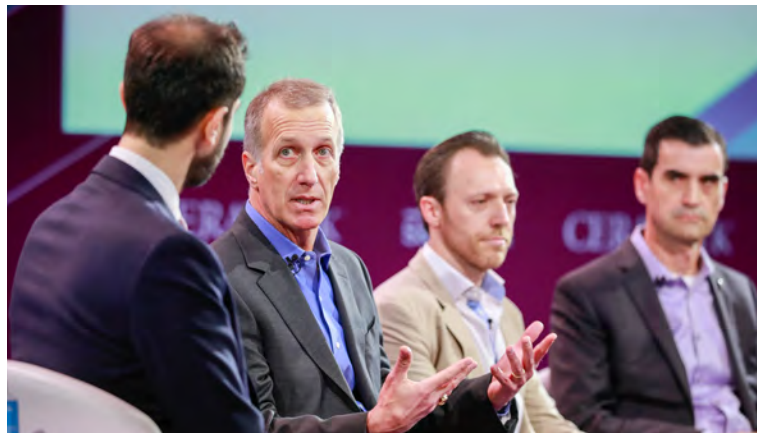
**Reinhard Fischer**, Senior Vice President, Strategy, Volkswagen North America, Volkswagen Group of America



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



**Brian Hlavinka**, Vice President of New Energy Ventures, Williams



**The Challenges Facing EV Charging Infrastructure in the Decade Ahead** with **Claudio Vittori** (Chair), Senior Technical Research Analyst, S&P Global; **Alex Gruzen**, Chief Executive Officer, WiTricity; **Levi Tillemann**, Vice President, Policy and International Outreach, Ample Inc; and **Robert Barrosa**, Senior Director, Sales, Business Development & Marketing, Electrify America



**Energy Cities: From oil capitals to energy transition capitals** with **Hon. Sylvester Turner**, Mayor, City of Houston, Texas; **Hon. Barney Crockett**, Lord Provost of Aberdeen, Aberdeen City Council; and **His Worship Michael Savage**, Mayor, Halifax Regional Municipality

# Theme: New Models of Finance and Investment

## Topics included

- Special Purpose Acquisition Corps (SPACs)
- Clean Tech and Energy M&A
- Institutional Investing in Clean Technology
- Investment Models for the Power Grid
- Financing Oil and Gas in the Clean Tech Era
- Investments in Energy Transition

**“Best gathering of senior energy executives anywhere on the planet.”**

— **Hunter Hunt**, Chairman & Chief Executive Officer, Hunt Energy, LLC



Leaving No One Behind: Innovative solutions for a just energy transition with **Trenton Allen**, Managing Director & Chief Executive Officer, Sustainable Capital Advisors; **Kerry O'Neill**, Chief Executive Officer, Inclusive Prosperity Capital; **Zoë Knight**, Group Head HSBC Centre of Sustainable Finance, HSBC Centre of Sustainable Finance; and **Michael Swack** (Chair), Director, Center for Impact Finance, Carsey School, University of New Hampshire



**Margaux Moore**, Head of Energy Transition Research Group, Trafigura



**Jim Sledzik**, Managing Director North America, Saudi Aramco Energy Ventures



**Bjørn Otto Sverdrup**, Chair of the Executive Committee, Oil and Gas Climate Initiative (OGCI)



# Theme: Digital Transformation

## Topics included

- Big Data and Predictive Analytics
- Robotics and Remote Operations
- Digital Twin Technologies
- AI & ML
- Cloud Computing
- Industrial IoT
- Cybersecurity and Risk
- A/R and V/R
- Agile Design
- Quantum Computing Technologies
- Blockchain

“CERAWeek brings the energy world together and remains unprecedented in terms of reach and caliber.”

— CBC



**Andrew Bruce**, President & Chief Executive Officer, Data Gumbo, and **Rebecca Hofmann** (Chair), President & Chief Executive Director, Blockchain For Energy



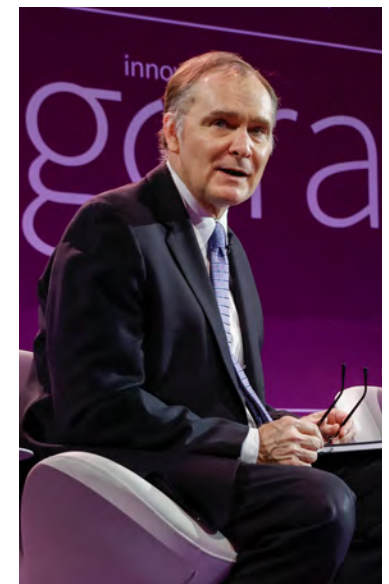
**Aadrin Azly**, Chief Digital Officer, PETRONAS



**Nicolaus Radford**, Founder, Chairman, President & CEO, Nauticus Robotics



**Paula Doyle**, Senior Vice President, Oil & Gas, Cognite



**James Bellingham**, Executive Director, Johns Hopkins Institute for Assured Autonomy, Johns Hopkins University

# Theme: Innovation and Digital Workforce

## Topics included

- Models of Innovation
- Digital Workforce of the Future
- Investment and Funding for Innovation
- Ocean Innovation and Sustainability
- Retraining for the Energy Transition
- Energy Innovation Ecosystems
- Diversity and Inclusion



**Accelerating Progress: Diversity, equity & inclusion in executive leadership** with Melody Boone Meyer, President, Women with Energy LLC, and President, Melody Meyer Energy LLC; Cheryl D'Cruz-Young, Senior Client Partner, ESG & CPO COE, Korn Ferry; and Angela McKane, Vice president technology insights, emerging & disruptive technologies, strategy & sustainability, bp p.l.c.



**Barbara Burger**, Vice President, Innovation & President, Chevron Technology Ventures, Chevron Corporation



**Darryl Willis**, Corporate Vice President Energy Industry, Microsoft Corporation



**Kenneth Medlock**, Senior Director, Center for Energy Studies, Baker Institute for Public Policy, Rice University



# Agora Studios

Decarbonization Pathways (70 sessions\*)



**Shifting Strategies in CCS: Implementing the “Hub” concept** with **Carolyn Seto** (Chair), Director, Upstream Technology & Innovation, S&P Global; **Rod Christie**, Executive Vice President, Turbomachinery & Process Solutions, Baker Hughes; **Chris Powers**, Vice President, Carbon Capture, Utilization, & Storage (CCUS), Chevron New Energies; and **Jane Norman**, Chief of Staff & Vice President of Strategy, Santos Ltd.

## Sessions included:

- Achieving Net Zero Through Biomass Fuels: Wood, crops, manure?
- Advancing Energy Innovation: Growth of the ecosystem
- Breakthroughs in Nature-based Solutions: Afforestation & reforestation
- Carbon Management: Building net zero
- Carbon Markets: Working with offsets
- Climate Advocates & the Energy Industry: Finding common ground
- Decarbonization Challenges & Technology Pathways
- Decarbonizing Industry: Critical technologies for energy transition
- Digital & Emerging Technologies & the Low-carbon Future
- Direct Air Capture: What will it take to scale up enough?
- Driving Low-carbon Innovation: Criteria for investing in early-stage companies
- Energy Transition: Big ambitions, hard realities



**Advancing Energy Innovation: Growth of the ecosystem** with **Robin Millican**, Director, U.S. Policy & Advocacy, Breakthrough Energy; **Barbara Burger**, Vice President, Innovation & President, Chevron Technology Ventures, Chevron Corporation; **Emily Reichert**, Chief Executive Officer, Greentown Labs; and **Atul Arya** (Chair), Senior Vice President & Chief Energy Strategist, S&P Global

- Globalizing CCUS Deployments
- How Can AI Applications Keep the Grid Stabilized?
- How to Accelerate the Energy Transition Across Multiple Sectors
- Meeting the Methane Challenge: Incorporating measurement methods
- Natural Carbon Sinks: Plants, oceans, soil
- Shifting Strategies in CCS: Implementing the “Hub” concept
- Sustainable Transport: Growing biofuels & green fuels production
- Technologies to Reduce Scope 1 & Scope 2 Emissions in Downstream & Midstream

*\*including sessions in Agora Pods, Hubs, and the Lyceum.*

# Agora Studios

## Clean Power and Hydrogen (80 sessions\*)



**Nuclear's Role in Achieving Net Zero** with **Daniel B. Poneman**, President & Chief Executive Officer, Centrus Energy Corp.; **Maria Korsnick**, President & Chief Executive Officer, Nuclear Energy Institute; and **John Wagner**, Laboratory Director, Idaho National Laboratory

### Sessions included:

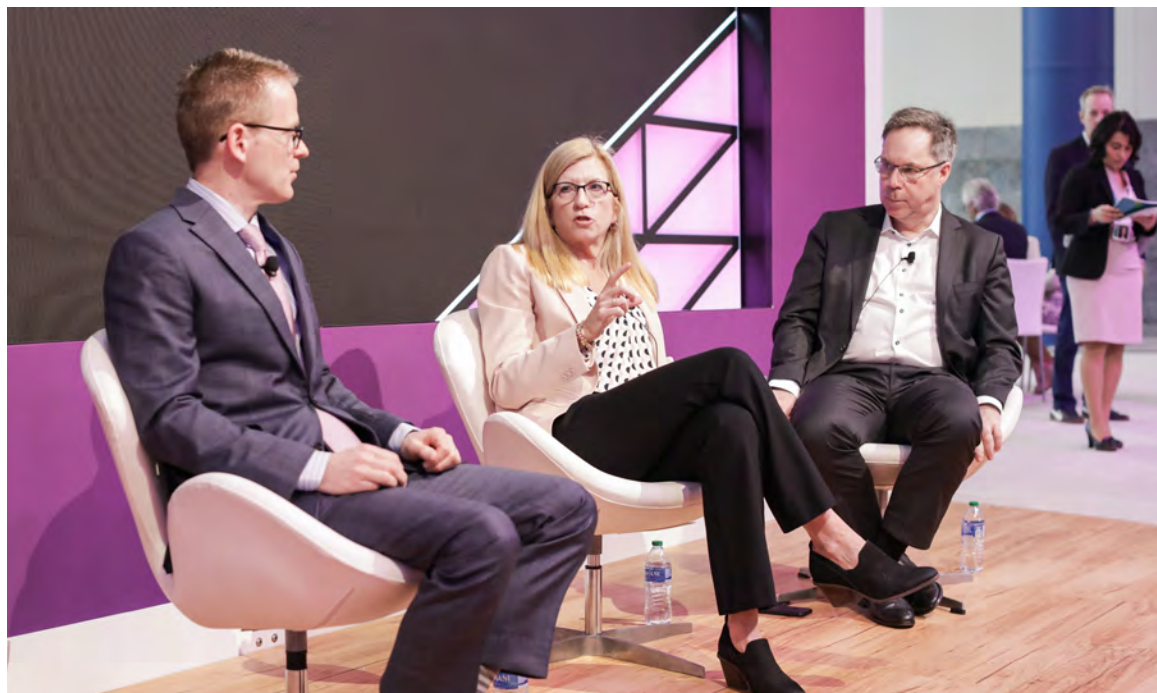
- Advanced Nuclear Technologies Leading to New Interest
- Advancements in Wind Technology: Increasing efficiency
- Bringing Electricity to Developing Countries
- Can Hydrogen Be the Next Diesel?
- Developing the Hydrogen Value Chain
- Direct Air Capture: What will it take to scale up enough?
- Driving Low-carbon Innovation: Hot research topics
- Electric Grid Reliability & Resiliency: Climate, planning & technology
- Electrifying Ocean Operations: Sea floor energy systems
- Energy Innovation Pioneers—Scaling the Mountain: Accelerating development of zero-carbon energy systems for deep decarbonization
- Establishing a Global Hydrogen Marketplace
- European Hydrogen Meetup
- Exploring Industry Collaboration for Hydrogen Development
- FCEVs & BEVs: The race to net zero
- Financing the Hydrogen Value Chain: From millions to billions
- From Hydrocarbon to Hydrogen?
- Fusion: Closer than you think
- Green Hydrogen: A road map to low costs & low carbon
- Gulf Coast Hydrogen
- H2 Collaboration & Partnerships
- Hot Stuff: Methane pyrolysis
- How Can Public Innovation Funding Supercharge Decarbonization?
- Hydrogen Hub Wrap Up: Talking Heads
- Hydrogen Production Costs: What's on the other side of the rainbow?
- Is Hydrogen a Viable Long-duration Storage Solution?
- Latin American Meetup
- Leveraging H2 Brownfield Infrastructure: A potential breakthrough for the US Gulf Coast
- Loco-motion: The race to power planes, trains & trucks with hydrogen
- Municipal Hydrogen: Creating city hydrogen hubs
- Nuclear: Ready to power the hydrogen economy
- Nuclear's Role in Achieving Net Zero
- Pipelines to Prosperity
- Policies Needed to Support Development of a Hydrogen Economy
- Powering Data Centers with Hydrogen
- Practical Lessons Learned in Measuring & Reducing Methane in O&G
- Renewable Power, Electrolyzer Technology & Storage
- Saving California Sunshine: Storing hydrogen underground
- Scaling-up Hydrogen: The race to the cheapest green hydrogen
- Technologies to Reduce Scope 1 & Scope 2 Emissions in Downstream & Midstream
- The Race to a Hydrogen Export Economy
- Transporting Hydrogen: How mobile is it?

*\*including sessions in Agora Pods, Hubs, and the Lyceum.*



# Agora Studios

## Mobility and the Built Environment (24 sessions\*)



**FCEVs & BEVs: The race to net zero** with **Randy MacEwen**, President & Chief Executive Officer, Ballard Power Systems; **Amy Adams**, Vice President – Fuel Cell & Hydrogen Technologies, Cummins Inc.; and **Holger Löscher**, Deputy Director General & member of the Executive Board, Federation of German Industries (BDI), and Chair, Industrial Affairs Committee

**“Unparalleled insight on the state and direction of the energy business.”**

— **Rob Fast**, Chief Technology Officer, Hess Corporation

### Sessions included:

- Automating the Built Environment: Maximizing efficiency, costs & emissions
- Cities Leading the Way: Climate challenges facing mayors & local governments
- Consumer Behavior & Electric Vehicles
- Creating Value from CO<sub>2</sub>: Synthetic fuels & building materials
- Electric or Eclectic Mobility? Why some believe that net zero has just saved the combustion engine
- Electrified Fleets: The real opportunity to enable the mobility & energy transition?
- Evolution of Smart Cities: Autonomy increasing with intelligence
- FCEVs & BEVs: The race to net zero
- Financing the Hydrogen Value Chain: From millions to billions
- Growing Power Infrastructure: Electrification of cities & public transport
- Loco-motion: The race to power planes, trains & trucks with hydrogen
- Municipal Hydrogen: Creating city hydrogen hubs
- Sustainable Transport: Growing biofuels & green fuels production
- The Challenges Facing EV
- Charging Infrastructure in the Decade Ahead
- Transporting Hydrogen: How mobile is it?

*\*including sessions in Agora Pods, Hubs, and the Lyceum.*

# Agora Studios

## New Models of Finance and Investment (10 sessions\*)



**Innovations in Clean Tech Financing: Are investors ready & willing?** with **Peter Gardett** (Chair), Executive Director, Climate & Cleantech, S&P Global; **Juliana Garaizar**, Head of Houston Incubator & Vice President, Innovation, Greentown Labs; **Deepa Poduval**, Vice President & Global Advisory Leader, Black & Veatch; and **Stephen Pang**, Managing Director, TortoiseEcofin

### *Sessions included:*

- Alternative Financing Models for Clean Tech Energy Transition
- Driving Low-carbon Innovation: Criteria for investing in early-stage companies
- ESG Small Group Workshop
- Financing the Hydrogen Value Chain: From millions to billions
- How Can Public Innovation Funding Supercharge Decarbonization?
- Innovations in Clean Tech Financing: Are investors ready & willing?
- Leaving No One Behind: Innovative solutions for a just energy transition
- Through the Energy Transition Capital Stack: Venture, debt, equity, asset finance & beyond

**“...an opportunity to peer into and sometimes touch the future.”**

— *Ashley Gilmore, Co-Founder and Chief Executive Officer, Tracts*

*\*including sessions in Agora Pods, Hubs, and the Lyceum.*

# Agora Studios

Digital Transformation (50 sessions\*)



**How Can AI Applications Keep the Grid Stabilized?** with Michael Nolan (Chair), Consulting Director, S&P Global; Danilo Moresco, Global Vice President, Power Generation & Water, ABB; Laura Anderson, Senior Vice President – Service Controls & Digitalization, Siemens Energy; and Yair Amir, Professor of Computer Science, Johns Hopkins University



**Quantum Computing: Solving big problems in energy transition** with Bill Vass, Vice President of Engineering, Amazon Web Services (AWS)

## Sessions included:

- Advancing Energy Innovation: Growth of the ecosystem
- AI in the Energy Production Process: Unlocking energy transition opportunities
- Collaboration & Partnerships: Critical path to energy transition
- Cybersecurity in the Energy Ecosystem: Lessons learned
- Digital & Emerging Technologies & the Low-carbon Future
- Digital Technology's Impact on the Energy Transition
- Digital Twins: From hype to gamechanger technology?
- Digitalization: Evolution or revolution?
- Evolution of Robotic Technologies in Energy Systems
- Frontiers of AI: What's New at Johns Hopkins?
- Growth & Success of Blockchain in Oil & Gas Supply Chains
- How Can AI Applications Keep the Grid Stabilized?
- Journey to the Edge: The need for critical real-time processing
- Quantum Computing: Solving big problems in energy transition
- View from the Ivory Tower: Role of universities in advancing decarbonization technologies

*\*including sessions in Agora Pods, Hubs, and the Lyceum.*



# Agora Studios

## Innovation and Digital Workforce (48 sessions\*)



**Competing for Young Talent in a World of Energy Transition** with **Minuri De Silva** (Chair), Global Research Analyst, Upstream Energy, S&P Global; **Deanna Jones**, Chief Human Resources Officer, Baker Hughes; **Jessica Van Singel**, Managing Director, Strategy & Consulting, Talent & Organization, Energy, Accenture; **Meerah Al Mulla**, Senior Production Engineer, Abu Dhabi National Oil Company (ADNOC)

### *Sessions included:*

- Accelerating Progress: Diversity, equity & inclusion in executive leadership
- Ally Energy | Powering the Energy Workforce Using Technology
- Diversity Dashboard
- Innovation in Plastics Recycling: Chemical vs. mechanical
- New Business Models for Bringing Climate Tech Solutions to Scale
- “Next Gen” Future Energy Leaders Town Hall
- Robotics: Lessons from the sea
- Scaling New Energy Minerals: Supply chains & technologies
- What’s New at Rice University?

**“...a great place to learn and make relevant connections”**

— *Colin Ardern, Co-Founder & Chief Executive Officer, Applied Bioplastics*

*\*including sessions in Agora Pods, Hubs, and the Lyceum.*



# Agora Voices of Innovation

Journeys and Insights by Pioneers and Thought Leaders



**Deepak Bagla**, Managing Director & Chief Executive Officer, Invest India



**Julie Sweet**, Chair & Chief Executive Officer, Accenture



**Ahmad O. Al Khowaiter**, Chief Technology Officer, Saudi Aramco



**Carol Anne Clayson**, Senior Scientist & Associate Director, Research Strategies, Woods Hole Oceanographic Institution (WHOI)



**Hon. Jason Kenney**, Premier, Province of Alberta, Canada



**David Victor**, Professor of Innovation & Public Policy, School of Global Policy & Strategy, University of California, San Diego (UCSD)



**Dr. Ernest Moniz**, Founder & Chief Executive Officer, Energy Futures Initiative



**Lord John Browne of Madingley**, Senior Advisor, General Atlantic and Chairman, BeyondNetZero



**Jigar Shah**, Director, Loan Programs Office, United States Department of Energy

## Agora Voices of Innovation (*continued*)



**Kara Hurst**, Vice President,  
Worldwide Sustainability, Amazon



**Lorenzo Simonelli**, Chairman and  
Chief Executive Officer, Baker Hughes



**Sunita Narain**, Director General,  
Centre for Science and Environment



**Yi Cui**, Director of Precourt Institute  
for Energy, Professor of Materials  
Science and Engineering, Stanford  
University



**Vijay Swarup**, Vice President, Research & Development,  
ExxonMobil Research and Engineering Company



**Robert Armstrong**, Director, MIT  
Energy Initiative; Chevron Professor of  
Chemical Engineering, Massachusetts  
Institute of Technology



**Walter Isaacson**, Leonard Lauder Professor of American  
History and Values, Tulane University & Author



# Agora Hydrogen Hub

Dedicated space to convene the emerging hydrogen ecosystem, with focused programming around hydrogen technologies, development, economics, finance, and policy.

## Sessions included:

- Can Hydrogen Be the Next Diesel?
- Developing the Hydrogen Value Chain
- Establishing a Global Hydrogen Marketplace
- Exploring Industry Collaboration for Hydrogen Development
- FCEVs & BEVs: The race to net zero
- Financing the Hydrogen Value Chain: From millions to billions
- From Hydrocarbon to Hydrogen?
- Green Hydrogen: A road map to low costs & low carbon
- Gulf Coast Hydrogen
- H2 Collaboration & Partnerships
- Hot Stuff: Methane pyrolysis
- Hydrogen Hub Reception: Hosted by Mitsubishi Heavy Industries
- Leveraging H2 Brownfield Infrastructure: A potential breakthrough for the US Gulf Coast
- Loco-motion: The race to power planes, trains & trucks with hydrogen
- Meet the Mayors
- Municipal Hydrogen: Creating city hydrogen hubs
- Nuclear: Ready to power the hydrogen economy
- Pipelines to Prosperity
- Policies Needed to Support Development of a Hydrogen Economy
- Powering Data Centers with Hydrogen
- Renewable Power, Electrolyzer Technology & Storage
- Saving California Sunshine: Storing hydrogen underground
- Scaling-up Hydrogen: The race to the cheapest green hydrogen
- The Race to a Hydrogen Export Economy
- Transporting Hydrogen: How mobile is it?
- Who Let the [Robot] Dogs Out?
- Meetups on:
  - » California Regional Hydrogen
  - » Climate Advocates & the Energy Industry
  - » Financing Hydrogen
  - » Latin American
  - » European Hydrogen
  - » Car Enthusiasts



**Establishing a Global Hydrogen Marketplace** with Alex Klaessig (Chair), Senior Director, Hydrogen & Renewable Gas Forum, S&P Global; Bill Elrick, Executive Director, California Fuel Cell Partnership; Alex Barnes, Senior Advisor, S&P Global; and Everett Anderson, Vice President, Advanced Product Development, Nel Hydrogen



**Renewable Power, Electrolyzer Technology & Storage** with Catherine Robinson (Chair), Research & Analysis Executive Director, S&P Global; Naomi Boness, Managing Director, Stanford Natural Gas Initiative & Co-Managing Director, Stanford Hydrogen Initiative, Stanford University; Jason Stevens, Director of Hydrogen Project Development & Execution, North America, EDP Renewables; and Raffi Garabedian, Co-Founder & Chief Executive Officer, Electric Hydrogen

# Agora Carbon Management Hub

A dedicated space to convene the carbon management ecosystem, with focused programming around the acceleration of carbon-management solutions using technology, finance, government policy, and stakeholder influence.

## Sessions included:

- A Conversation with Dr. Vanessa Chan, Chief Commercialization Officer & Director, Office of Technology Transitions, United States Department of Energy
- Breakthroughs in Nature-based Solutions: Afforestation & reforestation
- Carbon Management Hub Reception
- Carbon Management Hub Reception: Hosted by 8 Rivers
- Carbon Management: Building net zero
- Carbon Markets: Working with offsets
- Climate Advocates & the Energy Industry: Finding common ground
- Direct Air Capture: What will it take to scale up enough?
- Driving Low-carbon Innovation: Criteria for investing in early-stage companies
- Energy Transition: Big ambitions, hard realities
- Globalizing CCUS Deployments
- How to Accelerate the Energy Transition Across Multiple Sectors
- Natural Carbon Sinks: Plants, oceans, soil
- Robotics: Lessons from the sea
- Sustainable Transport: Growing biofuels & green fuels production
- Meetups with:
  - » Ahmad Al Khowaiter on Carbon Management
  - » Alliance to End Plastic Waste Meet & Greet
  - » David Victor on Carbon Management
  - » Hon. Minister Sonya Savage on Managing Alberta's Energy Resources
  - » Jules Kortenhorst on the Speed of the Energy Transition
  - » Steven Koonin on Carbon Management

**“...unequivocally very high-quality content, with superb networking opportunities.”**

— *Martin J. Houston, Vice Chairman & Co-Founder, Tellurian Investments Inc.*



**How to Accelerate the Energy Transition Across Multiple Sectors** with Paul Markwell, Senior Associate, S&P Global; Varun Sivaram, Senior Director for Clean Energy and Innovation, US Special Presidential Envoy for Climate John Kerry; and Jules Kortenhorst, Chief Executive Officer, RMI



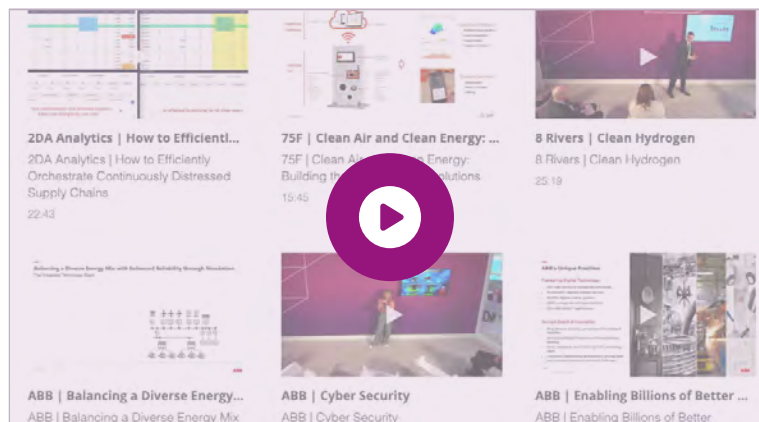
**Carbon Management: Building net zero** with Cameron Hosie, Chief Executive Officer, 8 Rivers



# Agora Pods

Deep-dive technology presentations, case studies, and startup “pitches” in a close-up, relaxed setting.

130 Agora Pods featuring startups and new technology



[Click to view Agora Pods video gallery](#) 



**Sunnova | How Decentralization Creates a More Reliable & Resilient Grid** with **Meghan Nutting**, Executive Vice President, Government & Regulatory Affairs, Sunnova



**Rice University | A Systems Perspective for the Energy Transition** with **Dr. Rachel A. Meidl**, LP.D., CHMM, Fellow in Energy & Environment, Rice University's Baker Institute for Public Policy



**Iraya Energies | Disruptive Technologies, Convergent Solutions: AI's role in the energy transition** with **Nina Marie Hernandez**, Chief Executive Officer, Iraya Energies

## Agora Pods (continued)



**Tree Energy Solutions (TES-H2) | Accelerating the Energy Transition of Europe by Importing Green & Clean Hydrogen with Raphael Loehr, Capital Projects Development, TES-H2**



**AVEVA | Transitioning to Tomorrow: Digital strategies helping accelerate the energy transition—The drive to net zero with Norton Green, Vice President, Executive Engagements, AVEVA, and Cindy Crow, Industry Principal Oil & Gas, AVEVA**



**EDF Renewables North America | Renewable Energy has a New Obsession...it's Called Data! with Rémi Raphael, Vice President of Digital Transformation & Information Technology, EDF Renewables North America**



**ABB | Cyber Security with Sandy Bouissa, US Regional Digital Lead, ABB**



**Hunt Energy | Next Generation Battery Technologies for Utility Scale & Electric Vehicles with Victor Liu, President, Hunt Energy Enterprises**



# Agora Partner Houses

A glimpse of what's ahead by the world's preeminent energy and technology companies. Houses offer immersive experiences and connections.



## Agora Partner Houses (continued)



**ExxonMobil**



 **Microsoft**



 **OXY**



 **PETRONAS**



# Agora Partner Houses *(continued)*

By the numbers

7 Partner Houses

54  
private tours

38  
VIP and  
government  
officials tours

6,000+  
attendee  
exposure

## Government Officials House Visitations

- Argentina | **Minister Martín Maximiliano Guzmán**, Minister of Economy and Delegation
- Colombia | **Hon. Iván Duque Márquez**, President, and Delegation
- Cote d'Ivoire | **Hon. Thomas Camara**, Minister of Mines, Petroleum & Energy and Delegation
- France | **Ambassador Philippe Étienne** of France to the United States
- India | **Anand Kumar Jha**, Deputy Secretary, Ministry of Petroleum and Natural Gas
- Kenya | **Hon. Eng. Andrew Kamau**, Principal Secretary, Ministry of Petroleum & Mining
- The Republic of Namibia | **Hon. Tom Alweendo**, Minister of Mines and Energy, Ministry of Mines and Energy
- Saudi Arabia | **Ziyad Aljarboua**, Director & Head of North America, Saudi General Investment Authority, Ministry of Investment
- United States | **Hon. Jennifer M. Granholm**, Secretary of Energy and Delegation
- United States | **Hon. Michael S. Regan**, Administrator, Environmental Protection Agency
- United States | **Dr. Vanessa Chan**, Chief Commercialization Officer & Director, Office of Technology Transitions, Department of Energy



Secretary Jennifer M. Granholm, United States Department of Energy, tours the ExxonMobil House.

# Lyceum Labs / Workshops

Interactive learning sessions and master classes with thought leaders and innovators (40+ sessions)



Geopolitics of Hydrogen Lyceum Lab led by Catherine Robinson, Executive Director, Research and Analysis, S&P Global and Alex Barnes, Senior Advisor, S&P Global

## Sessions included:

- 10 Cleantech Trends in 2022
- AES | AES Indiana's Innovative Consumer EV Adoption Program
- Anchoring the Decarbonized World with the NET Power Platform
- Autonomous Operations: The digital drivers of the energy transition
- AWS | Amazon's Culture of Innovation
- AWS/Telco | Collaborating with Telcos on a Journey to Net-Zero Carbon Emissions
- Can Batteries Play a Role in Green Hydrogen Production?
- Carbon Engineering | Decarbonizing Is Possible & It May Cost Less Than You Think
- Creating & Selling Premium Climate-friendlier Hydrocarbon Products & Services with CarbonSig Software
- Diversity Dashboard
- Enabling Successful IR4.0-based Engineering Transformation
- Energy for the Common Good | Getting Ready to Put Fusion to Work
- ESG Small Group Workshop
- Floating Offshore Wind: What is it & does it work?
- Hydrogen 101: Fuel cell vehicles
- Hydrogen 101: Geopolitics of hydrogen
- Hydrogen 101: The power of hydrogen
- MIT | Energy Choices: Pathways to decarbonization
- MIT | The Fundamental Science Behind Green Hydrogen Technologies
- NEI | Understanding Regulatory Risk for Advanced Nuclear Technologies
- Petronas | Building Smart Project Delivery for a Sustainable Future
- S&P Global | Automotive Industry on the Road to Net Zero
- S&P Global | Carbon Intensity of Crudes
- S&P Global | Cybersecurity, Ransomware, Sanctions & ESG
- S&P Global | Electricity in the Room: Rising connections between crypto & power generation
- S&P Global | Field-to-Wheels Decarbonization
- S&P Global | Innovating to Keep Crude Oil Benchmarks Strong: A discussion of Brent, WTI, Dubai & Murban
- S&P Global | Integrated Digital Platforms-A silent gamechanger
- S&P Global | Introduction to Carbon Sequestration: A pathway for meeting climate goals
- S&P Global | Oil Price Forecasting in the Era of Energy & Capital Transitions
- S&P Global | Refining and Energy Transition: Part of the decarbonization solution
- S&P Global | The ICE May Finally Be Melting
- S&P Global | The Right Measure: A guidebook to crude oil life-cycle GHG emissions estimation
- S&P Global | Transforming Data Delivery, Access & Integration
- S&P Global | Uncovering External Risk & Revenue Gaps of Clean Power Assets
- S&P Global Workshop | Building Predictive Machine Learning Models to Answer Key Questions in the Energy Industry
- S&P Global Workshop | The Application of Predictive AI/ML Models
- Siemens Energy | Case for Carbon Capture: Real-life strategies for utilizing CCUS in oil & gas
- Siemens Energy | On the Road to Net Zero: Cost-effectively scaling up clean hydrogen production
- U.S. Government Global Energy Policy

# Agora Highlights

## Robotic Dog Shows (2)



## Social Media Hub



## Book Signings (8)



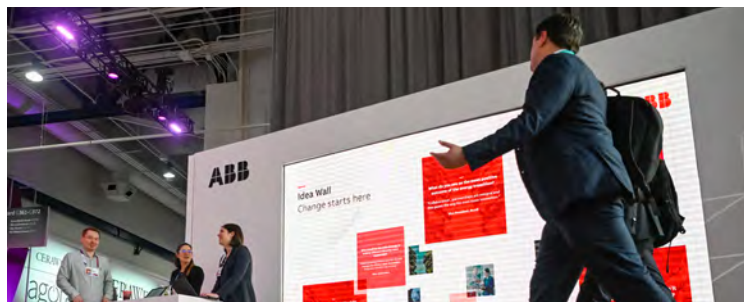
**John Doerr**, Chairman, Kleiner Perkins and author *Speed & Scale: An Action Plan for Solving Our Climate Crisis Now*.

## Mayor's Reception



**Hon. Sylvester Turner**, Mayor, City of Houston, Texas, US; **Hon. Barney Crockett**, Lord Provost, Aberdeen City Council, Scotland, UK; and **John Cypher**, Vice President, International Investment and Trade, Greater Houston Partnership

## Agora Partner Installations (6)



## Meetups (13)





# Agora Highlights

## Partnership Launches

Energy Ministers from Canada, Qatar, and the United States introduced the **Net-Zero Producers Forum** (NPF) at CERAWeek. Collectively representing 40% of global oil and gas production, the Net-Zero Producers Forum consisting of Canada, Norway, Qatar, Saudi Arabia, and the United States, are cooperating to develop pragmatic net-zero emission strategies.

“The Agora is a place to get the latest thinking about new technologies and businesses that will transform energy in the decades to come.”

— *David Victor, Professor of Innovation and Public Policy, School of Global Policy and Strategy, University of California, San Diego (UCSD)*

**8 Rivers and SK Group held a joint venture agreement signing ceremony.** This agreement represents one of the largest single private investments in a carbon capture solutions provider to date.

“...an important gathering of folks from every aspect of the energy sector.”

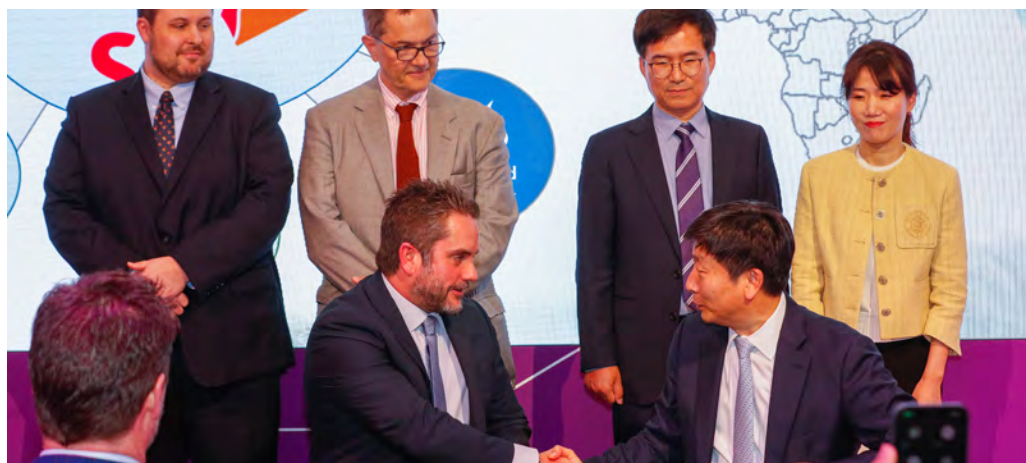
— *Hon. John Kerry, Special President Envoy on Climate, United States*

“Arguably the premier stop on the energy industry conference circuit.”

— *Financial Times*



Hon. Jonathan Wilkinson, Minister of Natural Resources, Canada; Hon. Jennifer M. Granholm, Secretary of Energy, United States Department of Energy; and H.E. Saad Sherida Al-Kaabi, Minister of State for Energy Affairs, Qatar



From left: 8 Rivers Capital **Damian Beauchamp**, President & Chief Development Officer; **Bill Brown**, Co-Founder & Executive Chairman; and **Cameron Hosie**, Chief Executive Officer; SK Inc. Materials: **Young Wook Lee**, President & CEO, SK Inc. Materials; **Ki Seon Park**, Vice President; and **Eun Kyung Sung**, Vice President, Investment & Environment

# Agora Highlights

## Energy Innovation Pioneers

The 17<sup>th</sup> annual Energy Innovation Pioneers (EIP) program featured many of the world's leading early-stage enterprises in energy and sustainability.

Pioneers were selected by a panel of S&P Global technology experts who identify companies—disruptive or enabling—that exemplify:

- Invention and creativity
- Feasibility and timeliness
- Scalability
- Superior management

Chosen from a field of over 500 candidates, this year's class of Pioneers was representative of the innovation occurring across the energy spectrum.

Representing a variety of emerging technologies and business models—advanced composite materials, carbon-free baseload power, carbon capture, cooling systems, distributed gas-to-liquids systems, energy recovery, hydrogen generation—these companies are leading innovators working to decarbonize the global energy system.

### 2022 Energy Innovation Pioneers

- Anax Power
- Carbon America
- Commonwealth Fusion Systems
- Emvolon
- Fervo Energy
- SAFCell
- Transaera
- TS Conductor



**Energy Innovation Pioneers—Playing the Hand You're Dealt: Accelerating decarbonization in existing energy systems** with Carolyn Seto (Chair), Director, Upstream Technology & Innovation, S&P Global; **Emmanuel Kasseris**, Chief Executive Officer, Emvolon, Inc.; **Jason Huang**, Co-Founder & Chief Executive Officer, TS Conductor; **Sorin Grama**, Co-Founder & Chief Executive Officer, Transaera, Inc.; and **Michael Longo**, Head of Business Development, Anax Power



**Energy Innovation Pioneers—Scaling the Mountain: Accelerating development of zero-carbon energy systems for deep decarbonization** with Carolyn Seto (Chair), Director, Upstream Technology & Innovation, S&P Global; **Bob Mumgaard**, Chief Executive Officer, Commonwealth Fusion Systems (CFS); **Brent Lewis**, Chief Executive Officer & Co-Founder, Carbon America; **Tim Latimer**, Co-Founder & Chief Executive Officer, Fervo Energy; and **Dr. Calum R.I. Chisholm**, Chief Executive Officer, SAFCell, Inc.

# Agora Highlights

## “Next Gen” Future Energy Leaders Town Hall

The race is ON for innovative, new approaches to solve the world’s greatest energy and climate challenges. The emerging generation of future energy leaders, technologists, and entrepreneurs have unprecedented opportunity for impact—and to create real change.

This special interactive “Next Gen” dynamic session featured rapid-fire insights by leading minds on energy innovation, along with CERAWeek Future Energy Leaders, focused on: How can we achieve net zero ambitions by 2050? How can we tackle climate while meeting the planet’s need for more energy? What are the promising and scalable technologies? What are the challenges and most exciting opportunities?



**Louis Carranza** (Chair), Associate Director, MIT Energy Initiative and **Vijay Swarup**, Vice President, Research & Development, ExxonMobil Research and Engineering Company



**Anish Simon**, Vice President, Emerging Tech & Innovation, Equinor



**Jordan Watson**, Senior Associate, Global Industrial Market, Korn Ferry

## Alliance to End Plastic Waste Meetup

Following the Executive Conference discussion on “Sustainability & Circularity: The changing world of chemicals & plastics,” the **Alliance to End Plastic Waste (AEPW)** hosted a meetup to share how AEPW is helping drive the shift to a more circular and sustainable world for plastics and chemicals.



**Justin Wood**, Vice President, Strategic Partnerships, Alliance to End Plastic Waste, and **Steve Sikra**, Vice President, Americas Alliance to End Plastic Waste respond to questions during a Meetup in the Agora Carbon Management Hub.



**Sustainability & Circularity: The changing world of chemicals & plastics** with **Jacob Duer**, President & Chief Executive Officer, Alliance to End Plastic Waste



# Agora Highlights

## Inaugural Energy Transition Venture Day Pitch Competition

The Energy Transition Venture Day pitch competition was hosted by the Greater Houston Partnership's Houston Energy Transition Initiative in partnership with Greentown Labs, Halliburton Labs, The Ion, Rice Alliance, and Chevron.

Twelve startups competed in four categories: carbon capture, use, and storage; hydrogen solutions; energy storage; and circular economy. A panel of investors selected the top pitch in each category.

The overall winner was **Parasanti**, an edge-computing software startup that provides real-time analytics to operators in remote and extreme environments with little to no Internet connection. Parasanti received an invitation to participate in the Chevron Technology Ventures catalyst program.

## Houston Innovators' Dinner

Following the competition, the overall winner and winners of the 4 individual categories were announced during a private Houston Innovators' Dinner in the Agora.



Energy Transition Venture Day judges **Abhinav Jain**, Vice President, CSL Capital Management, LLC, and **Grace Chan**, Associate, bp Ventures



Energy Transition Venture Day Competition's overall winner **Carrie Horazek**, Head of Commercial Development, Parasanti



Competition judge **Richard Pardoe**, Executive, Venture Capital, Chevron Technology Ventures, congratulates pitch winner of the Energy Storage category, **Dr. Ben Jawdat**, Founder & Chief Executive Officer, Revterra, during the dinner

# Agora Highlights

## Energy Transition Advancements by US National Labs

Leaders from US Department of Energy national labs discussed the cutting-edge technologies that will help to wean the United States from its reliance on fossil fuels to more sustainable and cleaner sources of energy.

“One of the most interesting and relevant programs on technology and 'big' strategy to be found in the energy industry.”



**Scientific Achievements: Role of National Labs in advancing energy transition** with Vijay Vaitheeswaran, Global Energy and Climate Innovation Editor, *The Economist*; **Dr. Douglas J. Arent**, Executive Director, National Renewable Energy Laboratory (NREL); **Brian Anderson**, Director, National Energy Technology Laboratory; and **Paul Kearns**, Director, Argonne National Laboratory

## Hydrogen Vision Dinner

Dinner roundtable discussion followed by a panel of industry experts explored a future where hydrogen provides up to as much as 25% of end-use energy. This interactive dinner delved into the challenges and opportunities of a hydrogen economy.

“I was blown away by the content, attendee list and energy.”

— *Rebecca Kruger, Managing Director, Goldman Sachs*



**Hydrogen Vision Dinner: What does 2050 look like?** with **Michael Stoppard**, Chief Strategist Global Gas, S&P Global; **Doreen Harris**, President & Chief Executive Officer, New York State Energy Research & Development Authority (NYSERDA); **Julien Rolland**, Head of Power and Renewables, Trafigura; and **Sharelynn Moore**, Executive Vice President of Markets & Strategy & Business Development, Bloom Energy



# Engage

## Networking and Meetups in the Agora



Mitsubishi Hydrogen Hub Reception



World Cities Partnership Mayors Reception with **Hon. Sylvester Turner**, Mayor, City of Houston, Texas (second from left)



BeyondNetZero Meetup



Hydrogen Hub Meetup

“The contacts we made are leading to an ongoing set of conversations and visits. This is entirely due to the opportunity to meet exceptional individuals from diverse backgrounds, and to have those strategic discussions that provide insight into the great challenges and the opportunities.”

— **James Bellingham**, Executive Director, Johns Hopkins Institute for Assured Autonomy, Johns Hopkins University



# Partnerships

CERAWeek Partners are committed to advancing the CERAWeek mission of thought leadership, shared learning, and relationship-building among industry, government, and society to secure the global energy future. Innovation Agora Partners support the exciting global innovation and technology community dedicated to creating new pathways and solutions for the energy future, contributing their expertise and experiences to this immersive environment.

The program integrates branding, knowledge contribution, media support, delegation support, hosting, and networking into a single, tailored strategy that supports the Partner's objectives.

## Partner Benefits

- High-level engagement before, during, and after the conference
- Maximized impact and experience of your executives' participation
- Access to Private Leadership Circles and Special Programs
- Support by the CERAWeek Executive Steering Committee and a team of dedicated CERAWeek Partner Liaison Managers

This unique platform creates an opportunity for Partners to deepen relationships with key stakeholders, developing and sharing ideas and thought leadership, while enhancing their visibility and profile. CERAWeek Partners also benefit from access to exclusive CERAWeek private programs, networking, and meeting spaces. The former are reserved exclusively for CERAWeek's senior-most participants, providing an invitation-only track of designated professional communities. These interactive sessions draw on Partners' expertise and thought leadership contributions.



# Partnerships

## Agora Partners





We look forward to seeing you at CERAWeek

**CERAWEEK®**  
by S&P Global

March 6-10, 2023  
Houston, Texas



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# S&P Global

S&P Global (NYSE: SPGI) provides essential intelligence. We enable governments, businesses and individuals with the right data, expertise and connected technology so that they can make decisions with conviction. From helping our customers assess new investments to guiding them through ESG and energy transition across supply chains, we unlock new opportunities, solve challenges and accelerate progress for the world.

We are widely sought after by many of the world's leading organizations to provide credit ratings, benchmarks, analytics and workflow solutions in the global capital, commodity and automotive markets. With every one of our offerings, we help the world's leading organizations plan for tomorrow, today. For more information, visit [www.spglobal.com](http://www.spglobal.com).