

# IEEE SusTech 2022

## Report on SusTech 2022

The 9<sup>th</sup> IEEE Conference on Technologies for Sustainability (SusTech 2022) was held virtually on April 21-23, 2022, broadcast from sunny Riverside, CA.

The SusTech 2022 Program featured Keynotes, Panels, Papers, Student Posters, and a Sustainable Aviation Forum. See <http://iee-sustech.org/archives> for details on the program and events.

The SusTech conference is designed to explore development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It brings together scientists, engineers, technologists and scholars from multiple disciplines to hold a dialogue on environmental issues and collaborate on ideas to develop and utilize innovative tools and intelligent systems to address the need for Sustainable Infrastructure. Attendees will learn about the emerging technologies, latest tools, and proactive solutions to take their sustainability programs to the next level. Papers are solicited from industry, government, and academia (including collegiate students) covering relevant research, technologies, methodologies, tools and case studies. Conference content that meets IEEE quality review standards and format will be submitted for inclusion into the IEEE *Xplore* Digital Library.

Sponsors for SusTech 2021 included the IEEE Oregon, Phoenix, San Fernando Valley, Inland Empire (Foothill), Orange County, Metro Los Angeles, and Coastal Los Angeles Sections, IEEE Region 6, IEEE-USA; and co-sponsored by the IEEE PES, SSIT and TEMS Societies.

### Attendees:

Total registrations 129, Author registrations 39 and Conference registrations 90 (includes committee and promotion)

## TECHNICAL PROGRAM

The technical program was presented on April 22-23 and consisted of twelve technical sessions with 46 papers grouped into nine topical areas and one special session, plus six Keynotes and two Panels. The technical sessions each consisted of nominally 4 20-minute slots with recorded paper presentations in MP4 and live Q&A time with the authors.

The topical areas were:

- Agriculture and Food Technology
- Sustainability Management (3 sessions)
- Intelligent Transportation Systems
- Renewable/Alternative Energy
- Smart Cities
- Smart Grid
- Water Resources Management
- Energy Efficiency
- Social Impact of Technology

Special Session topic: Powering Sustainable Aviation

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## SusTech 2022 Keynote Talks

“Sustainability and The Internet of Things: Translating Technology into Action”

Adam Drobot, Chairman, OpenTechWorks Inc.

“How engineers will save the world”

David Fork and Ross Koningstein, Google

Ref: <https://spectrum.ieee.org/engineers-you-can-disrupt-climate-change>

“Engineering in a Responsible World“

Jen M. Huffstetler, Intel

“Leveraging data to drive Sustainability in the Energy sector”

Jayant Sinha, Utilities India Industry Platform, Capgemini

“Climate Risks and Solutions”

Paul Werbos, National Science Foundation (retired), USA

“Nuclear Power for a Sustainable Future“

Steven Mirsky, NuScale Power

## SusTech Panels

### “Accelerating Renewable Energy through Standards”

Standards can make a difference in how a new technology is implemented, especially in the area of renewable energy. This panel will discuss recently released standards enabling renewable energy, and engagements related to these standards where IEEE is actively supporting clean energy and climate change solutions, including our involvement in the Global Power Systems Transformation Consortium.

### “Nuclear Power Trends”

Nuclear power continues to develop technologically. Abundant energy is the base for advanced societies. We are being squeezed by two forces. The first is that our coal and oil burning does inflict lethal damage. The second is that both are finite resource lifetimes. For sustainability we need to focus on technologies that can supply our needs – 24x7 and long term. This panel will discuss recent positive developments and trends in the nuclear industry.

## SUSTAINABLE AVIATION FORUM

For SusTech 2022, the Sustainability One-Day Forum theme was on **Sustainable Aviation** and was organized by Siobhan Dolan Clancy, Founder & CEO of SDC Business Consulting Ltd. And featured a number of world-class experts in the aviation field.

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**Sustainable aviation** involves activities to improve aircraft fuel efficiency, develop the next generation of efficient air traffic control, and develop new technologies and systems engineering processes to reach the future of carbon-neutral air transportation across the globe. The aviation industry has already made significant progress in fuel and CO2 efficiency, halving the amount of fuel used per flight compared to 1990. This has been achieved through technological advancement and improvements in operations and infrastructure. However, the aviation industry still represents approximately 2.5% of global human-induced CO2 emissions. In order for the industry to meet the climate goal of net-zero carbon emissions by 2050 it will require rigorous climate action and cooperation across the entire value chain operating as an ecosystem. The forum explored how the industry can get there with accelerated efficiency measures, energy transition and innovation across the aviation sector and in partnership with governments around the world.

## **Sustainable Aviation Forum Speakers:**

“Powering Advanced Air Mobility”

Dr. Stefan Breunig – Head of Strategy, Rolls-Royce Electrical

“Sustainable Aviation EcoSystem Model for a Regional Airport“

Jean Louis Debauche – Founder and CEO of JLD Consultant, Co-Founder of ZE-Glue Limited

“A Bright Era for Electrical in Aviation”

Dr. Hao Huang, Retired Technology Chief – GE Aviation Electrical Power

“How Can We Decarbonize Commercial Aviation by 2050?”

Zia Abdullah, National Renewable Energy Laboratory

“Vehicle Management System Challenges in Emerging Air Mobility Aircraft”

Brian Barker, President and CEO, Hummingbird Aero, LLC

“Planet Positive 2030: Prioritizing Sustainability for Technology”

John C. Havens, Sustainability Practice Lead, IEEE Standards Association

## **Sustainable Aviation Forum Panel**

“Evolving Aviation Ecosystem”

We are now seeing a fundamental paradigm shift in the way the aviation sector is embracing a net-zero emissions target by 2050, with a common understanding that it will take multiple stakeholders working together to make it possible. There is a coming together of industry stakeholders including airlines, airports, aircraft /engine manufacturers, fuel suppliers as well as government and regulators in declarations of commitment and partnerships to work together to reach the aggressive emission reduction target while the industry is forecasting passenger numbers and air traffic to double in the same timeframe.

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## STUDENT POSTER CONTEST

The SusTech 2022 Student Poster Contest was held on April 21. Students were invited to send in ideas or designs for developing projects/products supporting the sustainability topics areas of the Conference. A total of eleven posters were presented online, including from India and Hong Kong.

### First Place Winner

“Sustainable Space Exploration”

Bryce Jensen, Walter Foster, Forest Yllescas, Jason Knight-Han, Jesus Perez Quintero  
Sonoma State University (USA)

### Second Place Winner

“Smart Tracking Tray System for A Smart and Sustainable Wet Lab Community”

Nan Xu, Jingchen Li, Yue Yu, Yang Li, Jinglei Yang  
Hong Kong University of Science and Technology, HKSAR, China

### Third Place Winner

“Sustainable Eco-Friendly Compost Waste Heat Powerplant Design and Analysis”

Frederick Mitri, William Dennis  
Mechanical Engineering Department, California State Polytechnic University at Pomona (USA)

### Third Place Winner

“Automatic Unmanned Surface Vehicle-Based Water Quality Monitoring System”

John Ohmer, Gabriel Nicholson, Samuel Hobbs  
Department of Electrical Engineering, Sonoma State University (USA)

## AUTHORS

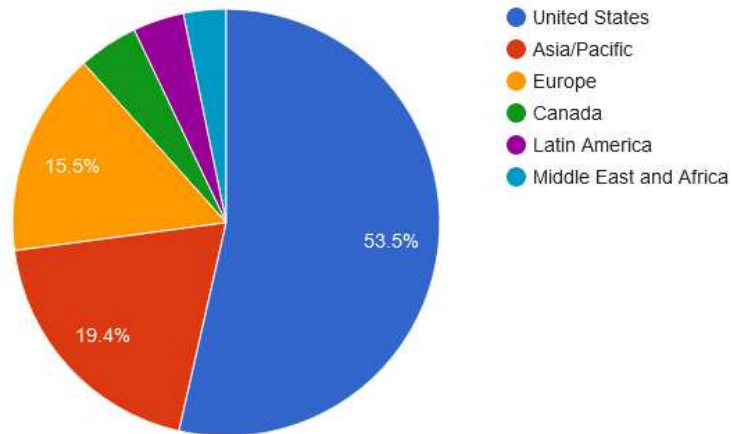
SusTech attracts an international audience. The breakdown of authors by Region and County are depicted below.

Region	Authors	%
United States	83	53.5
Asia/Pacific	30	19.4
Europe, Middle East, Africa	29	18.7
Europe	24	15.5
Canada	7	4.5
Latin America	6	3.9
Middle East and Africa	5	3.2

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Distribution of authors by region.

Regional distribution of authors



Distribution of authors by country.

Author distribution by country

