



ENGINEERING
SUSTAINABILITY 2017
INNOVATION AND THE TRIPLE BOTTOM LINE

April 9-11, 2017

David L. Lawrence Convention Center
Pittsburgh, PA

UNIVERSITY OF PITTSBURGH

Mascaro Center
for Sustainable Innovation

Carnegie Mellon University
STEINBRENNER INSTITUTE
for Environmental Education & Research



CONFERENCE OVERVIEW



EARLY REGISTRATION DEADLINE IS MARCH 10, 2017!

[CLICK HERE!](#)

FOR THE ONLINE REGISTRATION FORM

Sunday, April 9

5:30 – 7:30 p.m.

Welcome Reception Ten Penny

960 Penn Avenue

Join us for a casual, relaxed evening
with good food and drinks!

Monday, April 10

7:30 a.m. – 4:30 p.m.

Registration *DLLCC 4th Floor*

8:30 – 9:30 a.m.

Opening Plenary

9:45 – 11:25 a.m.

Concurrent Technical Sessions

11:30 a.m. – 12:30 p.m.

Invited Sessions

12:30 – 1:45 p.m.

Lunch Plenary

1:45 – 3:00 p.m.

Concurrent Technical Sessions

3:05 – 4:15 p.m.

Concurrent Technical Sessions

4:30 – 6:00 p.m.

Poster Session and Social

Tuesday, April 11

7:30 a.m. - Noon

Registration *DLLCC 4th Floor*

8:30 – 9:30 a.m.

Opening Plenary

9:45 – 10:45 a.m.

Invited Sessions

10:50 a.m. – 12:30 p.m.

Concurrent Technical Sessions

12:30 – 1:45 p.m.

Lunch Plenary

1:45 – 3:30 p.m.

Concurrent Technical Sessions



Opening Plenary

SUSAN HANDY

The Future of Travel Demand

Dr. Susan Handy is a Professor in the Department of Environmental Science and Policy and the Director of the National Center for Sustainable Transportation at the University of California, Davis. Her research interests center on the relationships between transportation and land use, particularly the impact of neighborhood design on travel behavior. Her current work focuses on bicycling as a mode of transportation and strategies for reducing auto dependence. She is a member of the Committee on Women's Issues in Transportation of the Transportation Research Board and is an associate editor of the Journal of Transport and Health. She holds a B.S.E. in Civil Engineering from Princeton University, an M.S. in Civil Engineering from Stanford University, and a PhD in City and Regional Planning from the University of California at Berkeley.

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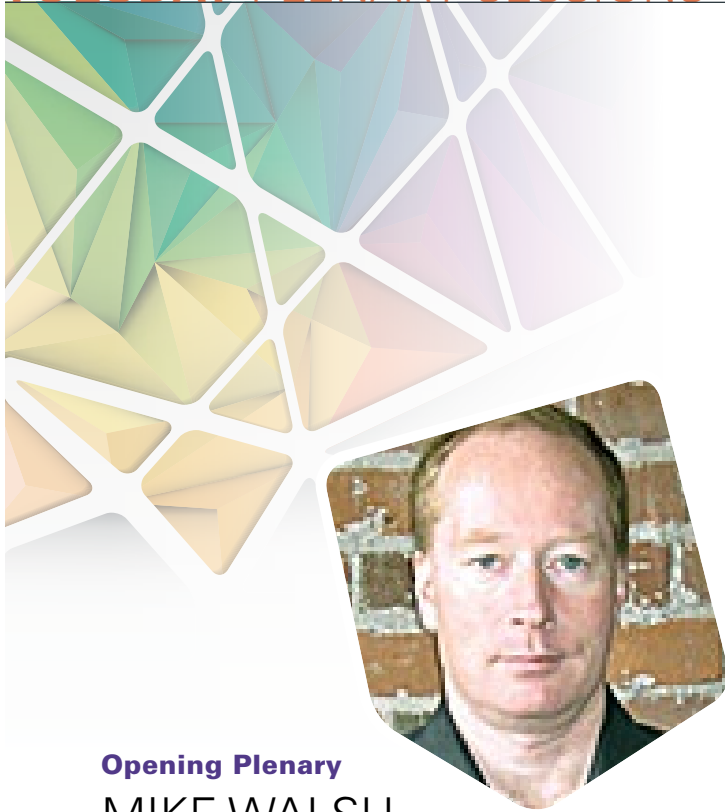
Luncheon Plenary

BRENT STEPHENS

Indoor Exposures to Outdoor Air Pollution

Brent Stephens is an Associate Professor in the Department of Civil, Architectural, and Environmental Engineering at Illinois Institute of Technology (IIT) in Chicago, IL. He also directs the Built Environment Research Group at IIT where he and his students investigate interactions between energy efficiency, indoor air quality, and environmental exposures within the built environment. Dr. Stephens also serves as Secretary of the International Society for Indoor Air Quality and Climate (ISIAQ), Chair of the ISIAQ Scientific and Technical Committee (STC) 21 on Ventilation, and Member and Research Subcommittee Chair of ASHRAE Technical Committee 2.4 on Particulate Air Contaminants and Particulate Contaminant Removal Equipment. Dr. Stephens has published over 35 peer-reviewed journal articles, editorials, and commentaries and his research has been funded by the U.S. Environmental Protection Agency (EPA), the Alfred P. Sloan Foundation (APSF), the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), the Centers for Disease Control (CDC) through the National Institute for Occupational Safety and Health (NIOSH), the Air-Conditioning, Heating and Refrigeration Institute (AHRI), and the National Air Filtration Association (NAFA) Foundation.





Opening Plenary
MIKE WALSH

Sustainability Applied: Using Smart Cities as a Framework for Engineers

Mike Walsh has over 20 years of experience designing, developing and utilizing computer based learning and communications tools to engage citizens and stakeholders in the process of creating sustainable, livable cities and regions. As one of the company's founders and the chief architect of MetroQuest, Mr. Walsh has been instrumental in evolving the MetroQuest technology from an early prototype into a web-delivered, software as a service, stakeholder engagement platform.

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Luncheon Plenary
AMY PRUDEN

Answering the Call: The Need for Modern Academics to Step Up as Leaders in Addressing our Failing Water Infrastructure

Amy Pruden is a Professor of Civil & Environmental Engineering at Virginia Tech in Blacksburg, VA USA. Her primary expertise is on tracking pathogens and antibiotic resistance genes through environmental systems and developing engineering control strategies for protecting public health. Her broad research mission is to advance the sustainability and health of our water systems through fundamental understanding of microbial ecology. Dr. Pruden received the Presidential Early Career Award in Science and Engineering in 2007 and the Paul L. Busch Award in 2014. Her 2014 article "Balancing Water Sustainability and Public Health Goals in the Face of Growing Concerns about Antibiotic Resistance," was recognized as the Editor's Choice Best Feature Article in Environmental Science and Technology. Dr. Pruden's research has been funded by the National Science Foundation, Water Research Foundation, Water Environment Research Foundation, Department of Energy, the U.S. Environmental Protection Agency, and The Alfred P. Sloan Foundation. Dr. Pruden will speak about her role in assisting with the response to the Flint Water Crisis and provide perspective on the role of academics in addressing our failing water infrastructure, particularly for vulnerable and disadvantaged communities.



Monday, April 10

OPENING PLENARY (8:30 - 9:30 a.m.)

Susan Handy

University of California Davis

The Future of Travel Demand

CONCURRENT SESSION I: SUSTAINABLE ENERGY

(9:45 - 11:25)

Tyler Harris

Clemson University

Logistic Growth Curve Modeling of U.S. Primary Energy Production Reveals Where Technology and Policy Fall Short, and Where Innovation is Required

John Stolz

Duquesne University

Turning Waste to Energy in Urban Communities: Biodigester Technology in Pittsburgh

Zane McDonald

University of California, Davis

Systems Analysis and Techno-economic Assessment of Hydrogen Energy Storage via Electrolysis from Curtailed Renewables: A WECC Case Study

John Vernacchia

Eaton

The Socially Responsible Microgrid

(presented by Eaton & UPMC)

CONCURRENT SESSION I: SUSTAINABLE BUILDINGS

(9:45 - 11:25)

Tripp Shealy

Virginia Tech

How the Redesign of Rating Systems Can Improve Sustainability

Jeremy Snyder

BuroHappold Engineering

Lessons Learned – Living Building Challenge Projects

Rebekah Burke

Arizona State University

I Can See Clearly Now: Illuminating the Material Selection Process for High Performance Buildings

Brock Glasgo

Carnegie Mellon University

Assessing the Value of Information in Residential Building Simulation: Comparing Simulated and Actual Building Loads at the Circuit Level

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CONCURRENT SESSION I: SUSTAINABLE WATER (9:45 - 11:25)

Elizabeth Wronko

Rochester Institute of Technology

Geospatial Risk Analysis and Freshwater Ecotoxicity Assessment of Potential Nanomaterial Release in the Great Lakes Region

Dan Flannery

Villanova University

Reversing Development Impacts through Green Infrastructure Restoration: Establishing a Baseline

Anurag Mantha

Virginia Tech

Lessons Learnt from Intensively Sampling Residential Water Heaters in Flint, MI

Robert Korenic

Youngstown State University

Youngstown State University "Gateway Project" Rain Garden Design Upgrades

INVITED SESSION I: A (11:30 - 12:30)

Anu Ramaswami

University of Minnesota

Urban Infrastructure Transformations toward Sustainable, Healthy and Equitable Cities

Sean Qian

Carnegie Mellon

Big Data Analytics for Sustainable Mobility

INVITED SESSION I: B (11:30 - 12:30)

Catherine Peters

Princeton University

Environmental Geochemistry Perspectives on Subsurface Energy Technologies

Rachel Brennan

Penn State University

Eco-Machine Aquaponics: Capturing Nutrients from Wastewater for Sustainable Food and Biofuel Production

LUNCH PLENARY (12:30 - 1:45)

Brent Stephens

Illinois Institute of Technology

Indoor Exposures to Outdoor Air Pollution

CONCURRENT SESSION II: AIR (1:45 - 3:00)

Torkan Fazli

Illinois Institute of Technology

Development of a Nationally Representative Set of Combined Building Energy and Indoor Air Quality Models for U.S. Residences

Yewande Abraham

Penn State University

A Case Study on Indoor Environmental Quality in a U.S. Residential Building

Melissa Bilec

University of Pittsburgh

Indoor Air Quality Tests in Multiple Pittsburgh Buildings

CONCURRENT SESSION II: SUSTAINABLE WATER (1:45 - 3:00)

Lauren Cook

Carnegie Mellon University

A Framework for Incorporating Downscaled Climate Output into Existing Engineering Methods: Application to Precipitation Frequency Curves

Kasparas Spokas

Princeton University

Geologic Carbon Storage and Leakage Risks

Michael German

Lehigh University

A New Sustainable Route to Age-old Softening: Less Chemicals, Less Sodium at Thermodynamic Efficiency

CONCURRENT SESSION II: EDUCATION (1:45 - 3:00)

David Riley

Penn State University

Engaged Scholarship Approach to Solar Energy Integration with Community Wells

Benjamin Chambers

Virginia Tech

BioBuild: Developing an Interdisciplinary Graduate Course Bridging the Sciences of Biology and the Built Environment

Mark Minster

Rose-Hulman Institute of Technology

Testing the Triple Bottom Line: Students, Sustainability, and Hydropower

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CONCURRENT SESSION III: FOOD (3:05 - 4:15)

Leanne Gilbertson

University of Pittsburgh

Leveraging Nanotechnology to Advance Agriculture Sustainability: Life Cycle Considerations and Recommendations

Dana Boyer

University of Minnesota

Are There Water and Greenhouse Gas Emissions Co-benefits to City-scale Food System Actions? Exploring Coupled Water and GHG Footprinting of Future Urban Food Scenarios

Nemi Vora

University of Pittsburgh

Food-Energy-Water Nexus: Quantifying Embodied Energy and Greenhouse Gas Emissions in Virtual Water Transfers

CONCURRENT SESSION III: SUSTAINABILITY INDUSTRY PANEL (3:05 - 4:15)

Sustainability – Industry Panel coordinated by Pitt's Center for Supply Chain Management

Mark Cancilla

Vice President EHS, PPG

Geoffrey Muessig

EVP & Chief Marketing Officer, PITT OHIO

Frank O'Brien-Bernini

VP & Chief Sustainability Officer, Owens Corning

Eric Paljug – Moderator

University of Pittsburgh

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CONCURRENT SESSION III: CASE STUDIES (3:05 - 4:15)

Rachael Sherman

Arizona State University

Small Buildings, Big Impacts: The Role of Small Commercial Building Energy Efficiency Case Studies in 2030 Districts

Harold Rickenbacker

University of Pittsburgh

Creating Environmental Consciousness in an At-Risk Community through Civic Engagement Strategies and Resident-Inclusive Mobile Air Quality Monitoring

Patricia Culley

Bohlin Cywinski Jackson

Equity by Nature - The Story of the Frick Environmental Center

POSTER SESSION & SOCIAL (4:30 - 6:00)

Preliminary List of Poster Presenters

Carnegie Mellon University

Clemson University

Colorado State University

Green Building Alliance

Illinois Institute of Technology

Indiana University

Morgan State University

New York University

Penn State University

Princeton University

Robert Morris University

Rochester Institute of Technology

Sam Houston State University

University of Illinois

University of North Carolina

University of Southern Mississippi

University of Pittsburgh

University of Virginia

Villanova University

Virginia Tech



TECHNICAL & INVITED SESSIONS – TUESDAY

Tuesday, April 11

OPENING PLENARY (8:30 - 9:30)

Mike Walsh

MetroQuest

Sustainability Applied: Using Smart Cities as a Framework for Engineers to Implement Sustainability

INVITED SESSION II: A (9:45 - 10:45)

Amy Landis

Clemson

Water Quality: The often Ignored Consequences of Emerging Technologies

Callie Babbitt

Rochester Institute of Technology

Applying Circular Economy Principles to the Lithium-ion Battery Waste Management Hierarchy

INVITED SESSION II: B (9:45 - 10:45)

John Little

Virginia Tech

Rapid Methods to Estimate Exposure to SVOCs in the Indoor Environment

Kyle Bibby

University of Pittsburgh

Source to Tap: What Shapes Microbial Communities in Our Drinking Water?

CONCURRENT SESSION IV: SUSTAINABLE ENERGY (10:50 - 12:30)

Ilke Celik

University of Toledo

Installing Emerging Photovoltaic Cells on Pervious and Impervious Surfaces: Toxicity Implications on Soil and Fresh Water Compartments

Nicole Ryan

University of Michigan

Life Cycle Environmental Impacts of Using Lithium Ion Batteries for Power System Reserves and Strategies for Mitigation

Nichole Hanus

Carnegie Mellon University

Measuring Pv Technical Potential and Financial Feasibility for Educational Buildings in the United States

Kevin Ketchman

University of Pittsburgh

Disaggregating Small Commercial End-use Energy Using a Novel Bottom-up Approach

CONCURRENT SESSION IV: SUSTAINABLE BUILDINGS (10:50 - 12:30)

Rodolfo Valdes-Vasquez

Colorado State University

The Current Status of Green Design and Construction Related to Fire Stations in the U.S.

Nathan Kegel

IES

Climate Change: Impacts on Building Energy use Intensity

Samaneh Gholitabar

New York University

Mapping Wind Energy Potential in New York City using Geographic Information System Platform and Semi-analytical Methods

Robert Phillips

Northeastern University

Modeling the Triple Bottom Line in Commercial Buildings

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CONCURRENT SESSION IV: SUSTAINABLE WATER (10:50 - 12:30)

Michael Shreve

Penn State University

Fungal Diversity and Trace Organic Contaminant Removal in Six Full-Scale Integrated Fixed-Film Activated Sludge (Ifas) Wastewater Treatment Plants

Madeline Foley

Villanova University

Integration of Triple Bottom Line Integrators to Prioritize Stormwater Management Infrastructure

Kerim Dickson

Carnegie Mellon University

Sustainable Management of Water Resources in the U.S.: Interbasin Transfers and their Drivers

Annie Pearce

Virginia Tech

The Connections Between the Three Water Networks



LUNCH PLENARY (12:30)

Amy Pruden

Virginia Tech

Answering the Call: The Need for Modern Academics to Step Up as Leaders in Addressing Our Failing Water Infrastructure

CONCURRENT SESSION V: SUSTAINABLE BUILDINGS (1:45 - 3:30)

Sandeep Langar

The University of Southern Mississippi

Design of a Resilient Building: An Assessment of Designer Knowledge-base

Justin Henriques

James Madison University

A Framework for Analyzing Climate Change Vulnerability in the Built Environment

Rohini Srivastava

Carnegie Mellon University

Decision Maker's Response to Triple Bottom Line Cost Benefits of Energy Efficiency

Laura Nettleton

Thoughtful Balance

Passive House: The Affordable Path to Net Zero Energy

CONCURRENT SESSION V: SUSTAINABLE TRANSPORTATION (1:45 - 3:30)

Isaac Smith

Green Building Alliance

Make My Trip Count: The impact of How Pittsburghers Commute

Ashwin Kumar Balaji

Carnegie Mellon University

Shared Wireless Charging Infrastructure Model for Electric Vehicles

Brianna Lawton

Morgan State University

Life Cycle Cost Analysis Framework for Evaluating Resilient Modulus Testing Strategies used for Characterization and Design of Sustainable Roadway Infrastructure

Greg Schivley

Carnegie Mellon University

Environmental Implications of Autonomous Electric Vehicle Adoption and Use Patterns



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CONFERENCE GUEST INFORMATION

Accommodations

Westin Convention Center - Pittsburgh

1000 Penn Avenue
Pittsburgh PA 15222

412-281-3700

A block of rooms has been reserved at the hotel. Please mention Engineering Sustainability 2017 to receive the conference rate of \$175 per night.

The conference rate cutoff date is March 10, 2017.

For more information about the **Westin Convention Center** or to reserve a room, **CLICK HERE**.

Courtyard by Marriott - Pittsburgh Downtown

945 Penn Avenue
Pittsburgh PA 15222

412-434-5551

A block of rooms has been reserved at the hotel. Please mention Engineering Sustainability 2017 to receive the conference rate of \$165 per night.

The conference rate cutoff date is March 19, 2017.

For more information about the **Courtyard by Marriott** or to reserve a room, **CLICK HERE**.

Questions

If you have questions, please contact Gena Kovalcik at the Mascaro Center for Sustainable Innovation at 412-624-9698 or mcsi@pitt.edu, or visit the official conference website at www.engineering.pitt.edu/mcsi/ES2017

Continuing Education

The ES17 organizing committee is pleased to share that many of the conference plenary and technical sessions are eligible for USGBC/GBCI continuing education units. USGBC provides individuals with the ability to self-report CEUs. Go to www.usgbc.org for additional information.

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