NATIONAL ACADEMIES *Sciences*
Engineering
Medicine

Committee on Repurposing Plastics Waste in Infrastructure

White Papers Presentations—Session 2
Web-meeting via Zoom

Agenda
October 5, 2022
3pm-5:00pm Eastern Time

Meeting Purpose

Hear the presentations from the authors of two commissioned papers and discuss their interim findings.

3:00 pm **Opening Remarks and Introductions**
> David Dzombak, *Committee Chair*

3:05 pm **Assessment of the Economics of Plastic Waste Recycling**

> Randolph Kirchain, *Co-Director, MIT Concrete Sustainability Hub, Principal Research Scientist, Massachusetts Institute of Technology*
> Elizabeth Moore, *Research Scientist, MIT*
> Basuhi Ravi, *Doctoral Candidate in Material Sciences, MIT*
> Karan Bhuwalka, *Doctoral Candidate in Mechanical Engineering, MIT*

4:10 pm **Durability and Life-cycle Implications of Repurposing Plastic Paste in Infrastructure: A Case Study**

> Zhiye Li, *Postdoctoral Research Fellow, Stanford University*

5:00 pm **Adjourn Session**

Presenter Biographies

Basuhi Ravi

Basuhi is a PhD candidate in Materials Science and Engineering with a focus on polymeric materials. Her doctoral research concerns understanding the barriers to plastics circularity – this journey has led her to investigate the plastic waste management system in the United States, weigh the environmental benefits and pitfalls of advanced recycling methods against mechanical recycling, analyze quality considerations for recycling from a macromolecular perspective, and study the economics of PET recycling to inform legislative levers towards solving the plastic waste problem.

Karan Bhuwalka

Karan is a PhD Candidate in Mechanical Engineering at MIT, with a master's in Technology Policy. His research studies the plastic waste management system in the US to help identify policies that can improve recycling. He is also interested in evaluating the availability of critical metals required for clean energy.

Elizabeth Moore

Dr. Moore is a Research Scientist in the MIT Materials Systems Lab. Her research investigates the environmental, economic, and social challenges of emerging material and technology systems. In 2018, she was a Visiting Scientist at the United Nations University for Environment and Human Security, where she worked with a team to assess the geospatial information capacity of countries for disaster risk reduction. Her current projects include advanced manufacturing workforce road mapping, mineral and commodity market analysis, and economic and environmental modeling of hydrogen production technologies.

Randolph Kirchain

Dr. Kirchain is a Principal Research Scientist in the MIT Material Systems Lab and is the Director of the MIT Concrete Sustainability Hub. Dr. Kirchain's research focuses on the environmental and economic implications of materials selection. The choice of material potentially has sweeping implications on the realization of a product. Materials affect not only properties, but also dictate available production processes, and therefore the physical constraints within which a designer must work. Similarly, the synergism of design, materials, and process affect the environmental impacts associated with a product's manufacture, its use, and its ultimate disposal. As such, understanding the implications of a material selection decision requires understanding throughout the design and production systems. To address this, Dr. Kirchain's research deals with two broad topic areas: 1) the development of methods to model the cost of manufacture, using limited design information and 2) the sustainability of current and emerging materials systems.

Zhiye Li

Dr. Li is a postdoctoral researcher in Civil and Environmental Engineering at Stanford University in the field of data-driven innovation and multiscale modeling on climate-resilient and sustainable civil infrastructures. She is also a researcher at the Stanford Center at the Incheon Global Campus (SCIGC) and the John A. Blume Earthquake Engineering Center at Stanford University. Her interdisciplinary research integrates multiphysics model, machine learning, life cycle assessment and material innovation to accelerate the global net-zero transition. Within civil engineering, her research focuses on developing new building materials and building practices for more sustainable built environments. She researched at Hopkins Extreme Materials Institute and completed her Ph.D. in Civil Engineering at Johns Hopkins University.