MIT Industrial Liaison Program Faculty Knowledgebase Report

2021 MIT Sustainability Japan Webinar

May 20, 2021 - May 21, 2021

DAY 1: May 20 (Thursday)

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9:00 AM - 9:05 AM	Welcome and Introduction Keiji Yano Program Director, MIT Corporate Relations Associate Director, MIT-ILP, Japan
	Keiji Yano Program Director, MIT Corporate Relations Associate Director, MIT-ILP, Japan
	Keiji Yano is a program director at MIT Corporate Relations and associate director of MIT-ILP, Japan in Tokyo. He has been associated with the office since September 2008 and has been enjoying connecting Japanese ILP member companies with the MIT community since then. He has been always fascinated by the risks companies are willing to take to make an impact in society. Prior to joining the ILP, Yano managed his own consulting company while he was a visiting researcher at the MIT Whitehead Institute for three years. Prior to that, he was the technical area manager for the Asia/Pacific region at Coventor, an MIT-connected startup software company developing MEMS. While at Coventor he established many relationships with companies from all over the world. He provided services to help companies design and build prototypes for new devices or products. He started his career as a process engineer in the basic design group from concept design to preoperation test of the Nuclear Waste plant project for Tokai #2 Nuclear Power Plant in Japan. He holds a B.S. in science and technology from Nihon University and Ph.D. in Fluid Dynamics in Aerospace Engineering from the Ohio State University. View full bio

9:05 AM - 9:30 AM

The MIT Environmental Solutions Initiative (ESI)
John Fernández
Director, Building Technology and Engineering Systems,
Professor, MIT Department of Architecture

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MIT Department of Architecture

Professor John E. Fernández is a professor in the Department of Architecture at MIT, affiliated with the Department of Urban Studies and Planning, and a practicing architect. Fernández is also Director of the Massachusetts Institute of Technology Environmental Solutions Initiative, enlisting the capacity of the MIT community in the transition to a net zero carbon, biodiverse and equitable future.

Fernández founded and currently directs the MIT Urban Metabolism Group and is a member of the World Economic Forum Global Commission on BiodiverCities by 2030, the Urban Climate Change Research Network, and the Leadership Team of Oceanvisions. He has published on a wide range of subjects, from sustainable cities, urban biodiversity, design, and more, and is the author of two books and numerous articles in scientific and design journals, including *Science, the Journal of Industrial Ecology, Building and Environment, Energy Policy* and others, and author of nine book chapters. He is formerly Chair of Sustainable Urban Systems for the International Society of Industrial Ecology and Director of the MIT Building Technology Program from 2010 to 2015.

View full bio

Today we are at the brink of an accelerating climate crisis while half the world lives in cities and rates of biodiversity loss and deforestation are at historic highs. We are also in a golden era of scientific and engineering breakthroughs and technology and market innovation. From advances in artificial intelligence to carbon capture we may be witnessing the emergence of a transformation of society and industry toward a sustainable, equitable and humane future. Prof. Fernandez will describe the mandate and work of MIT's primary environmental organization charged with creating solutions to climate change and other environmental challenges. The work of the ESI leverages key capacity of the entire MIT faculty, student body and staff across diverse topics in research, education and engagement. The expansion of the ESI bodes well for MIT's ever more targeted role in a sustainable future. In this mission we hope to partner with you.

9:30 AM - 9:55 AM

Current Business and R&D for Sustainable Society

Isamu Yashima
Fellow of Mitsui Mining & Smelting

The purpose of my talk is to introduce Mitsui Mining & Smelting's efforts toward a sustainable society. I will explain the relationship between our social activities and SDGs, CSR, and ESG. As an initiative for renewable energies, we are focusing on the hydroelectric power generation business and the geothermal power generation business. As of recently in our developments for a sustainable society, we will introduce new oxygen ion conductor and a safe sulfide all-solid-state battery.

9:55 AM - 10:05 AM

MIT Startup Exchange Lightning Talk

InEnTec: Gasifier technology that safely transforms waste into clean fuels and other valuable products

Jeffrey Surma
President and CEO
InEnTec

MIT Startup Exchange Lightning Talk

Renewlogy: Innovative solutions for renewing waste and creating circular economies

Priyanka Bakaya
Founder & CEO
Renewlogy

10:05 AM - 10:25 AM

Electrification and Decarbonization of Chemical Synthesis
Karthish Manthiram
Theodore Miller Career Development Chair and Assistant Professor, Chemical Engineering

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Karthish Manthiram is the Theodore T. Miller Career Development Chair and Assistant Professor in Chemical Engineering at MIT. The Manthiram Lab at MIT is focused on the molecular engineering of electrocatalysts for the synthesis of organic molecules, including pharmaceuticals, fuels, and commodity chemicals, using renewable feedstocks. Karthish received his bachelor's degree in Chemical Engineering from Stanford University and his Ph.D. in Chemical Engineering from UC Berkeley, where his dissertation research was focused on the development of nanoscale materials for storing solar energy in chemical bonds. Most recently, he was a postdoctoral researcher at the California Institute of Technology, where he worked on developing new ionically-conductive polymers using olefin metathesis. Karthish's research has been recognized with several awards, including the NSF CAREER Award, DOE Early Career Award, 3M Nontenured Faculty Award, American Chemical Society PRF New Investigator Award, Dan Cubicciotti Award of the Electrochemical Society, and Forbes 30 Under 30 in Science. Karthish's teaching has been recognized with the C. Michael Mohr Outstanding Undergraduate Teaching Award, the MIT ChemE Outstanding Graduate Teaching Award, and the MIT Teaching with Digital Technology Award. He serves on the Early Career Advisory Board for *ACS Catalysis* and on the Advisory Board for both *Trends in Chemistry* and the *MIT Science Policy Review.*

Chemical synthesis is responsible for significant emissions of carbon dioxide worldwide. Using renewable electricity to drive chemical synthesis may provide a route to overcoming the carbon footprint, by enabling synthetic routes which operate at benign conditions and utilize sustainable inputs. We are developing an electrosynthetic toolkit in which distributed feedstocks, including carbon dioxide, dinitrogen, water, and renewable electricity, can be converted into diverse fuels, chemicals, and materials. In this presentation, we will first share recent advances made in our laboratory on nitrogen fixation to synthesize ammonia at ambient conditions. We will then discuss how to drive selective carbon dioxide reduction and use water as an oxygen-atom source for epoxidation reactions. These example reactions will illustrate how the modularity of chemical manufacturing could be enhanced through electrochemical routes which open up local and on-demand production of critical chemicals and materials.

10:25 AM

Closing Remarks

1??: 2021? 5? 20? (?)

??????????????????????????????? (Download Agenda and Speakers' Bio in Japanese)

9:00 AM - 9:05 AM

Welcome and Introduction

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Program Director, MIT Corporate Relations
Associate Director, MIT-ILP, Japan

9:05 AM - 9:30 AM

The MIT Environmental Solutions Initiative (ESI)

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Professor, Architecture, Building Technology and Engineering Systems
Director, Environmental Solutions Initiative

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9:30 AM - 9:55 AM

Current Business and R&D for Sustainable Society

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??SDGs?CSR?ESG???

9:55 AM - 10:05 AM

MIT Startup Exchange Lightning Talk

InEnTec: ??????????????????????????????????????

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InEnTec

MIT Startup Exchange Lightning Talk

Renewlogy: ??????????????????????????????????

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Renewlogy

10:05 AM - 10:25 AM

Electrification and Decarbonization of Chemical Synthesis

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Theodore Miller Career Development Chair and Assistant Professor, Chemical Engineering

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10:25 AM

Closing Remarks

DAY 2: May 21 (Friday)

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9:00 AM - 9:05 AM

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He holds a B.S. in science and technology from Nihon University and Ph.D. in Fluid Dynamics in Aerospace Engineering from the Ohio State University.

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9:05 AM - 9:30 AM

When to Embrace Sustainability in a Business (and When Not To)
Yossi Sheffi
Elisha Gray II Professor of Engineering Systems
Director, MIT Center for Transportation and Logistics

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Director
MIT Center for Transportation and Logistics

Yossi Sheffi is an expert in systems optimization, risk analysis and supply chain management. He is author of a text book and seven award-winning management books. His latest books are: “The New Abnormal: Reshaping Business and Supply Chain Strategy Beyond Covid-19,” (October 1, 2020) and “A Shot in the Arm: How Science, Technology and Supply Chains Converged to Vaccinate the World (October 2021).

Under his leadership, MIT CTL has launched many educational, research, and industry/government outreach programs, including the MIT SCALE network involving six academic centers round the world. In 2015, CTL has launched the on-line Micromaster’s program, enrolling over 480,000 students in 196 countries.

Outside the institute, Dr. Sheffi has consulted with numerous organizations. He has also founded or co-founded five successful companies, all acquired later by large enterprises.

Dr. Sheffi has been recognized in numerous ways in academic and industry forums and won dozens of awards.

He obtained his B.Sc from the Technion in Israel in 1975, and SM and Ph.D. from MIT in 1978.

For more information visit: http://sheffi.mit.edu/

View full bio

Despite the increasing evidence of climate change and its growing consequences, green promises have outpaced green actions. Most consumers, companies, and governments have made only minor, incremental changes to their behavior. Even the promised changes, if actually enacted, are at best ineffective and at worst will ensure that the planet continues on its current destructive path. The addition of billions of developing countries consumers to the world’s idle class is likely to doom any small changes. My argument is that while current efforts should continue, the solution is technology for carbon sequestrations and storage (it the green movement will still stall the development of nuclear plants).

9:30 AM - 9:55 AM

Efforts for Sustainability in Ajinomoto Group: solution-providing group of companies for food and health issues

Yukiko Takatori
General Manager of Sustainability and Development
Ajinomoto

As food and health issues are diversified, by unlocking the power of amino acids, Ajinomoto Group aim to contributes to greater wellness and improving the dietary habits for people worldwide. We are developing business in more than 130 countries and regions. We have a social responsibility to contribute to the development of the region, while respecting diverse cultures, values ??and human rights. In addition, our business activities are supported by many resources and energy, we must improve the environmental burden throughout the value chain, including reducing greenhouse gas emissions.

We updated our vision for 2030 last year. We want to achieve sustainability through our business with the goals of " By 2030 help extend the healthy life expectancy of 1 billion people" and "By 2030 reduce the environmental impact by 50%." My talk will be Introducing our ideas and initiatives aimed at contributing to a healthy mind and body, a recycling-oriented society, and a diverse and prosperous society.

9:55 AM - 10:05 AM

MIT Startup Exchange Lightning Talk

Sourcemap: Supply chain transparency platform

Leonardo Bonanni
Founder & CEO
Sourcemap

MIT Startup Exchange Lightning Talk

Via Separations - Membrane platform that transforms industrial separations by improving filtration materials and reducing energy

Brent Keller
Co-Founder & CTO
Via Separations

10:05 AM - 10:25 AM

Assessing the Environmental Benefits of Materials Recovery in Commodity Materials
Elsa Olivetti
Associate Dean, MIT School of Engineering; Jerry McAfee Professor in Engineering; Professor, MIT Department of Materials Science and Engineering

Elsa Olivetti
Associate Dean, MIT School of Engineering; Jerry McAfee Professor in Engineering; Professor
MIT Department of Materials Science and Engineering

Professor Olivetti received a BS in engineering science from the University of Virginia in 2000, and a PhD in materials science and engineering from MIT in 2007. She spent her PhD program studying the electrochemistry of polymer and inorganic materials for electrodes in lithium-ion batteries. In 2014, she joined DMSE as an assistant professor. As an educator, Olivetti overhauled DMSE's undergraduate curriculum and developed new courses, including one for the MIT Climate and Sustainability Consortium Climate Scholars. She's a member of the MIT Climate Nucleus and co-director of the MIT Climate & Sustainability Consortium.

Professor Elsa Olivetti's research focuses on improving the environmental and economic sustainability of materials. Specifically, she develops analytical and computational models to provide early-stage information on the cost and environmental impact of materials. Professor Olivetti and her research-group colleagues work toward improving sustainability through increased use of recycled and renewable materials, recycling-friendly material design, and intelligent waste disposition. The Olivetti Group also focuses on understanding the implications of substitution, dematerialization, and waste mining on materials markets.

Environmental benefits attributed to recycling rely on the assumption that we are substituting energy intensive primary production for lower-impact secondary production. However, this argument tends to be a purely engineering lens on a complex socioeconomic system. This presentation will discuss whether closing material and product loops does, in fact, prevent primary production. The basis for this counter argument is that when secondary replaces primary, it decreases the price of secondary and thus more primary will switch to secondary if possible, causing primary price to drop, and driving up demand for more primary which may negate the potential for substitution. There is a strong parallel in this argument to the concept of energy efficiency rebound, and is also referred to as the potential for secondary material to displace primary production. The critical aspects that influence displacement are the ability of secondary products to substitute for primary products, and price effects. This presentation will describe tools and analytical modeling efforts that explore the potential for recycling displacement for the case of commodity materials such as paper, copper and aluminum. These approaches help to assess the contexts under which recycling may reduce a material or product footprint.

10:25 AM	Closing Remarks

2??: 2021? 5? 21? (?)

??????????????????????????????????? (Download Agenda and Speakers' Bio in Japanese)

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9:05 AM - 9:30 AM	When to Embrace Sustainability in a Business (and When Not To) ?????????? Elisha Gray II Professor, Engineering Systems Director, Center for Transportation and Logistics (MIT CTL) Professor, Civil and Environmental Engineering Professor, Institute of Data Science and Society ??
9:30 AM - 9:55 AM	???????????????????????? ~???????????????~ ?? ?? ??????????? ?? ??????? ??130 ??????????? ??? ??????????
9:55 AM - 10:05 AM	MIT Startup Exchange Lightning Talk **Sourcemap:** ???????????????????? ????????? ????????? Sourcemap MIT Startup Exchange Lightning Talk **Via Separations**: ??? ???????? ????????????? Via Separations
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10:25 AM	Closing Remarks