



**ENGINEERING SOLUTIONS FOR SUSTAINABILITY:  
MATERIALS AND RESOURCES 3**

**Toward a Circular Economy**

February 18-19, 2017 | Denver, Colorado

**Agenda -- as of December 7, 2016**

Yellow = Awaiting confirmation

7:00-8:00a	Registration/Breakfast
8:00-8:30a	<p>WELCOMES AND CONVENING</p> <ol style="list-style-type: none"> <li>1. Nikhil Trivedi, 2016 AIME President</li> <li>2. Tim Arnold, SME 2016 President</li> <li>3. Brajendra Mishra, Worcester Polytechnic Institute and John Craynon, Export Import Bank of the United States</li> </ol>
8:30-10:30a	<p>SESSION 1 – SUSTAINABLE DEVELOPMENT AND THE CIRCULAR ECONOMY</p> <p><i>Goal: Make “circular economy” a part of everyone’s working vocabulary. Develop a foundation and common terms to help all see the big picture and how the smaller pieces fit into the puzzle.</i></p> <p><b>Moderator: Jessica Kogel, NIOSH?</b></p> <ol style="list-style-type: none"> <li>1. Chris Guenther, Ellen MacArthur Foundation: What is the circular economy?</li> <li>2. Florian Kongoli, Flogen: Role of engineering sciences on sustainable solutions toward a circular economy</li> <li>3. Diran Apelian, Worcester Polytechnic Institute: Circular economy – A pathway to resource recovery and recycling</li> <li>4. Carol Russell, EPA (retired)/Deborah Shields, Colorado State University: International efforts and activities</li> </ol>
10:30-10:45a	Break
10:45a-12:45p	<p>SESSION 2 – CASE STUDIES: CHALLENGES &amp; SUCCESSFUL BUSINESS MODELS</p> <p><i>Goal: Bring philosophical concepts to practical levels. Learn from firms which have been trying to implement these concepts and hear how it has gone and how to implement best practices.</i></p> <p><b>Moderator: Jonathan Motherwell, JTM and Associates, LLC</b></p> <ol style="list-style-type: none"> <li>1. Jill Cooper and Elizabeth Smith, Anadarko: How Anadarko incorporates the circular economy into its business model</li> <li>2. Bob Bassett, Holland and Hart: The Model Mine Development Agreement (MMDA) and sustainability in mining</li> <li>3. Rick Wagner, Chevron Phillips: Fueling the sustainability journey – top 3 elements for success</li> <li>4. Speaker TBD, EPA Sustainable Materials Management:</li> </ol>
12:45 -1:45p	Lunch

1:45-3:15p	SESSION 3 -- EDUCATING THE FUTURE ENGINEER
<p><i>Goal: Discuss challenges that need to be addressed by academia to better prepare future engineers to more effectively promote and implement the benefits of a circular economy through incorporation of appropriate curricula in addition to the more standard, historical technical focus areas.</i></p> <p><b>Moderator: Deborah Shields, Colorado State University</b></p> <ol style="list-style-type: none"> <li>1. Jeff Fergus, Auburn: Introducing the circular economy to undergraduate students</li> <li>2. Brajendra Mishra, WPI:</li> <li>3. Catherine Mulligan, Concordia: An interdisciplinary research and training program in sustainability - CIWESS</li> <li>4. Jessica Smith, Colorado School of Mines: Where are the people? Including social sustainability in the circular economy</li> </ol>	
3:15-3:30p	Break
3:30-5:00p	SESSION 4 – WATER
<p><i>Goal: Water is at the core of so many processes along a product or asset life cycle, so it is important that everyone understand these resulting challenges, especially given the emotional and local/regional factors that are integrated as part of this important, strategic topic.</i></p> <p><b>Moderator: Carol Russell, EPA (retired)</b></p> <ol style="list-style-type: none"> <li>1. Will Sarni, Deloitte:</li> <li>2. Eleanor Allen, Water For People:</li> <li>3. Stephen Northey, Monash: Water footprinting communicating mine site water performance in a circular economy</li> <li>4. Joe Lima, Schlumberger:</li> </ol>	
5:00-5:30p	REVIEW OF DAY 1:
5:30-7:00p	SESSION 5 – POSTER SESSION AND NETWORKING RECEPTION
<ol style="list-style-type: none"> <li>1. Timothy Ajayi, OSIT: Sustainable energy generation through waste water: a case study of the city of Lagos, Nigeria</li> <li>2. Li Chengcheng, SEU: Engineering of a -glucosidase hyper-production trichoderma reesei strain with glucose tolerant ability and the application in ethanol production</li> <li>3. Ross Guenther, Ceramext: Ceramext technology recycles mine tailings to quality ceramic products</li> <li>4. Sumedh Gostu, WPI: Impact of red-mud recycling on environment sustainability</li> <li>5. Sean Kelly, Worcester Polytechnic Institute: Value creation through enabling technologies to up-cycle aluminum scrap</li> <li>6. Yan Wang, Worcester Polytechnic Institute: Options for end-of-life EV Li-ion batteries</li> <li>7. Mark Strauss, Worcester Polytechnic Institute: The Recovery of Yttrium and Europium from Phosphor Dust</li> </ol>	

**Day 1: February 18, 2017**

**Day 2: February 19, 2017**

7:00-8:00a	Registration/Breakfast
8:00-10:00a	<p>SESSION 6 –BUILDING BLOCKS FOR THE CIRCULAR ECONOMY (TED talk format)</p> <p><i>Goal: Understand critical facets of making a circular economy work.</i></p> <p><b>Moderator: Roland Moreau, ExxonMobil (retired)</b></p> <ol style="list-style-type: none"> <li>1. Linda Battalora, CSM: Stakeholder engagement – “The wedding diagram”</li> <li>2. Flora Moon, Expressworks: Integration of concepts into a company’s business plan</li> <li>3. Atalay Atasu, Georgia Tech: Challenges and pit falls to avoid</li> <li>4. Jeff Keaton, ASCE: Regulatory –ready sustainability or sustainability-ready regulators</li> </ol>
10:00-10:15a	Break
10:15-11:45a	<p>SESSION 7 – SYSTEM IMPLEMENTATION</p> <p><i>Goal: Learn some concepts and expectations to be integrated in sustainable business</i></p> <p><b>Moderator: Jeff Keaton, ASCE</b></p> <ol style="list-style-type: none"> <li>1. Janet Peargin, Chevron: Do more with less – design for the triple bottom line for sustainable development footprint optimization</li> <li>2. Jacopo Seccatore, UAI: Economic viability of responsible small-scale mining</li> <li>3. Colton Bangs, Umicore: The circular economy for electronics gold mine or race to the bottom</li> <li>4. Kimberly Martin, Arizona State University: Alternatives to deep foundations to enhance sustainability of infrastructure projects</li> </ol>
11:45a-12:45p	Lunch
12:45-2:15p	<p>SESSION 8 – ENVIRONMENTAL/WASTE</p> <p><i>Goal: Discuss how environmental and waste management have evolved over recent time beyond the standard recycle/reuse mindset to require a more comprehensive understanding of the overarching processes associated with environmental protection and waste minimization/optimization.</i></p> <p><b>Moderator: Jeff Fergus, Auburn University</b></p> <ol style="list-style-type: none"> <li>1. Eric Peterson, Idaho National Laboratory: Metals recovery and recycling</li> <li>2. Sophie Theys, Bureau Veritas: Waste as a useful circular economy indicator</li> <li>3. Emmanuel Atta-Obeng, West Virginia University: Characterization of green carbons produced by the hydrothermal carbonization of a biorefinery lignin waste-stream</li> <li>4. Sean Monkman, Carbon Cure: More sustainable concrete produced using waste cement industry CO2</li> </ol>
2:15-2:30p	Break
2:30-4:00p	<p>SESSION 9 – FUTURE VISIONS FOR THE CIRCULAR ECONOMY (Panel format)</p> <p><i>Goal: Interactive sharing on ESS:M&amp;R3 learnings and engineering solutions to move us further toward a circular economy. Vision from the different stakeholder perspectives.</i></p> <p><b>Moderator: Nikhil Trivedi, IDEKIN International</b></p> <ol style="list-style-type: none"> <li>1. Linda Battalora, CSM: Hydrocarbon development and the sustainability lifecycle: What is the role of the Citizen Engineer?</li> <li>2. Dale Keairns, AIChE Past President: Energy, food, water nexus</li> <li>3. World Bank? rePurpose? International Finance Corporation? Industry?</li> </ol>
4:00-4:30p	<p>CONFERENCE WRAP-UP AND FUTURE PLANS FOR ESS:M&amp;R</p> <p><i>Goal: Develop Top 10 Takeaways</i></p> <ol style="list-style-type: none"> <li>1. ESS:M&amp;R3 Committee (John and Brajendra)</li> <li>2. AIME (Nikhil)</li> </ol>