



Dr. Datu Buyung Agusdinata Seminar

Thursday, March 7th at 10:30 am

ARMS 1109

System-of-Systems Research Agenda for Sustainability and Sustainable Development

How can we better tackle sustainability issues such as reducing carbon emissions and achieving sustainable development goals such as reducing poverty? To address this question, the talk will highlight some research agenda from a System-of-Systems (SoS) perspective. SoS provides an alternative framework for structuring and analyzing a problem and designing effective policy and intervention solutions. Three illustrative case studies will be presented. *First* is the socio-environmental impacts of lithium mining. Increased demand for lithium-ion batteries to power clean technologies such as electric-drive vehicles can cause a degradation of water resources, biodiversity, and societal well-being where the minerals are extracted. *Second* is interventions for conserving food, energy, and water resources at the household level. This poses a significant challenge due to the complex interplay between human behaviors, technologies, and policies. In an NSF-funded research project, a role-playing game has been developed to increase awareness for environmental issues and influence behaviors towards more sustainable practices. *Third* is the implementation of the UN sustainable development goals (SDGs). The adoption of the SDGs presents an opportunity to steer the global development efforts to sustainable pathways. However, it also poses a challenge as to how to operationalize and achieve the various goals in cost-effective, inclusive, and equitable ways. The goal of the talk is to stimulate a discussion on the potential and challenges in advancing the SoS methodology.

Datu Buyung Agusdinata is an assistant professor in the School of Sustainability at Arizona State University. He received a B.S. degree in Aerospace and Mechanical Engineering from the Bandung Institute of Technology, Indonesia, an M.S. degree in Aerospace Industrial Engineering (*Cum Laude*) and a Ph.D. degree in Systems Engineering and Policy Analysis, both from the Delft University of Technology, The Netherlands. His previous assignments include post-doctoral researcher and associate research scientist at Purdue University. His main research interests cover sustainable energy and transportation systems, food-energy-and water nexus, and sustainable development. Dr. Agusdinata was the recipient of the International Council on Systems Engineering (INCOSE) Fellowship to advance the state of practice of systems thinking and perspective. He has published in various journals including *Environmental Research Letters*, *Simulation & Gaming*, *Journal of Nanoparticle Research*, *Natural Hazards*, and *Environmental Science and Technology*.