

Gregory Keoleian



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Sponsored by: The Student Sustainability Initiative The Graham Environmental Sustainability Institute The Center for Research on Learning and Teaching

What Are the Environmental Impacts of Everyday Technologies?

Teaching Strategy

Gregory Keoleian teaches courses on sustainable energy systems and industrial ecology. His courses bring together students from SNRE, public health, engineering, architecture, and business to create a multidisciplinary learning environment.

In order to fully understand energy systems and their implications for sustainability, Professor Keoleian uses case studies of familiar technologies, such as refrigerators, cars, and the modern home.

Students evaluate energy systems and case studies with specific analytical tools: life cycle assessment and costing, ecological footprinting, and carbon accounting.

Professor Keoleian believes that collaborations among many disciplines are needed to transform the energy system. Thus, his courses incorporate group projects that allow students to work with a diverse set of colleagues. Group projects include comparisons of environmental impacts among energy technologies, such as lithium ion batteries versus compressed air energy storage for wind farm applications, as well as comparative life cycle analyses (e.g., air, water, and waste emissions and energy consumption) for different consumer products, like the Amazon Kindle versus paperback books.

Faculty Perspectives

"In developing the teams, I try to put together students from different disciplines so they can learn from each other. That environment is very representative in terms of what we face solving problems in industry or the government. It's usually teams of experts coming together to solve these complex problems rather than just an engineer or just an environmental scientist."

"One of the things we emphasize in this course is how to measure progress towards sustainability and specific metrics that define sustainability."

Student Perspectives

"Professor Keoleian makes things relatable to your everyday life. Everything you consume has some sort of invisible impact."

"Going into this class I really didn't know that much about sustainability, and Professor Keoleian gave me a framework for looking at things."

Examples of Teaching and/or Student Artifacts



The Carbon Footprint of Everyday Things



Water Footprint



Life Cycle Analyses and Consumer Decisions: This or That?