

# G7 Environment

Universities for Sustainable Development



**G7** 2017  
ITALIA



MINISTERO DELL'AMBIENTE  
E DELLA TUTELA DEL TERRITORIO E DEL MARE



MINISTERO DELL'AMBIENTE  
E DELLA TUTELA DEL TERRITORIO E DEL MARE

# Session 1: Teaching and Research for Sustainable Development

Callie Babbitt  
Golisano Institute for Sustainability  
Rochester Institute of Technology  
Rochester, NY, USA



# The Golisano Institute for Sustainability at RIT



## Knowledge to enable the future sustainability workforce

- Graduate degrees (Ph.D., M.S., M.Arch.)
- Corporate training
- Focus on sustainable technology and the built environment

## Research & development

- University-industry partnerships
- “Triple-bottom-line”: people, prosperity, and the planet



## Solutions to global challenges

- Demonstration through campus operations
- Local, regional, global partners



# 1) Problem-based vs. disciplinary-based approach

## Sustainability Science:

Defined by *problems* it addresses rather than by disciplines it employs

>> Does not fit into traditional academic silos

Seeks understanding of *interactions* between nature and society<sup>1</sup>

>> Bridging traditionally disparate fields

Has a goal of creating and applying knowledge in support of decision making for sustainable development<sup>2</sup>

>> Must facilitate creation of “use-inspired” knowledge



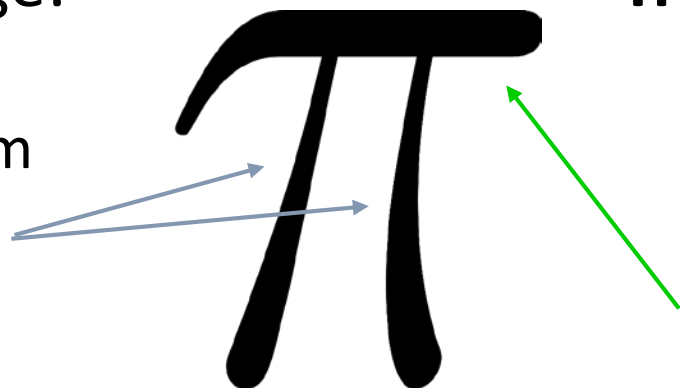
<sup>1</sup>Kates *et al.* 2004. *Science* 292:641-642; <sup>2</sup>Clark & Dickson, 2003. *PNAS* 100:8059-8062.

# A “Pi-shaped” Model of Graduate Training

## Fundamental knowledge:

Fundamental **domain** knowledge (carried on from undergraduate training or professional experience)

**Sustainability** knowledge that encompasses the three pillars: economy, society, and the environment.

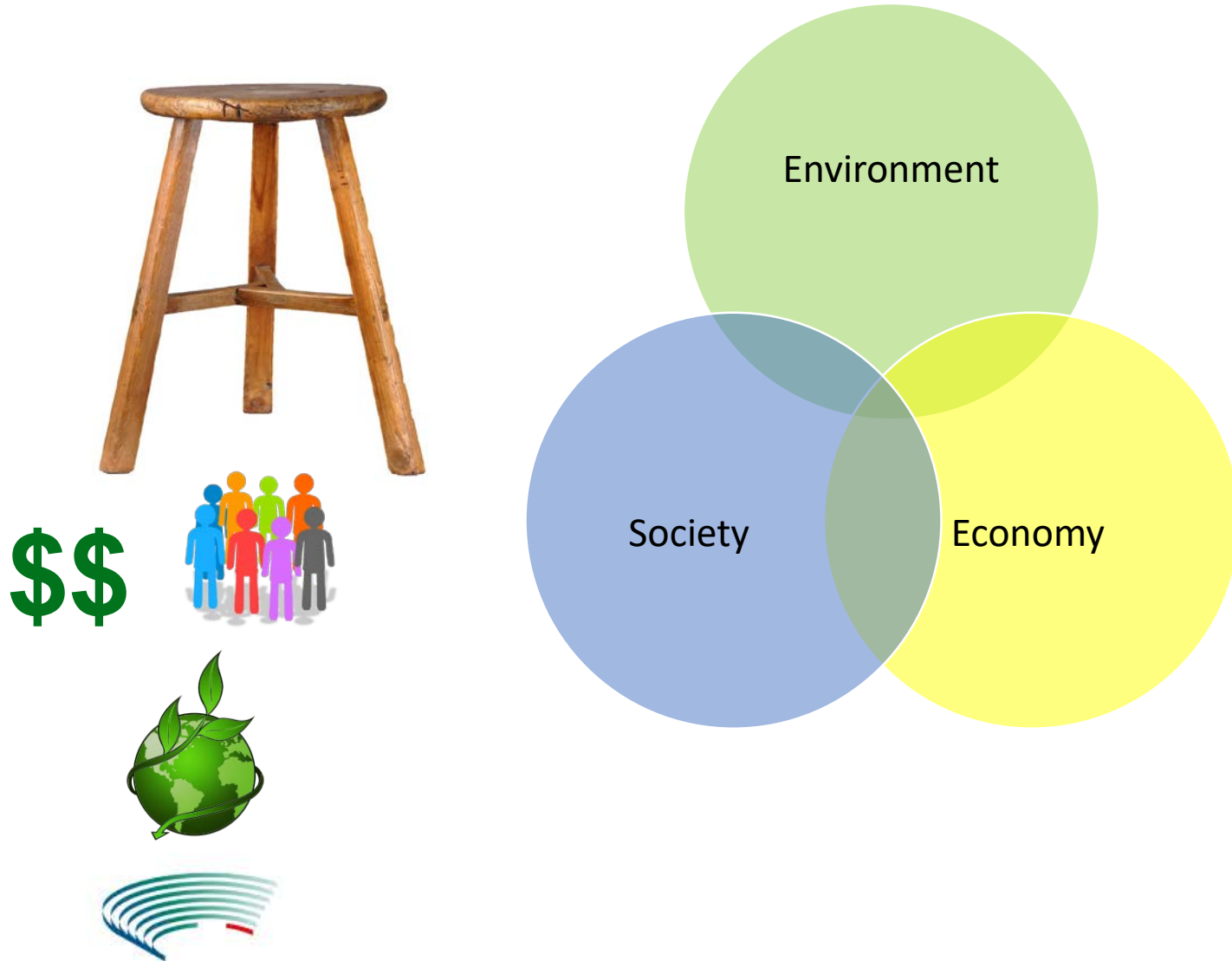


## Transversal skills:

Ability and motivation to understand, appreciate, and seek out interdisciplinary perspectives and collaborations. Ability and eagerness to translate research to solutions using **leadership**, **communication**, and **entrepreneurship** skills.



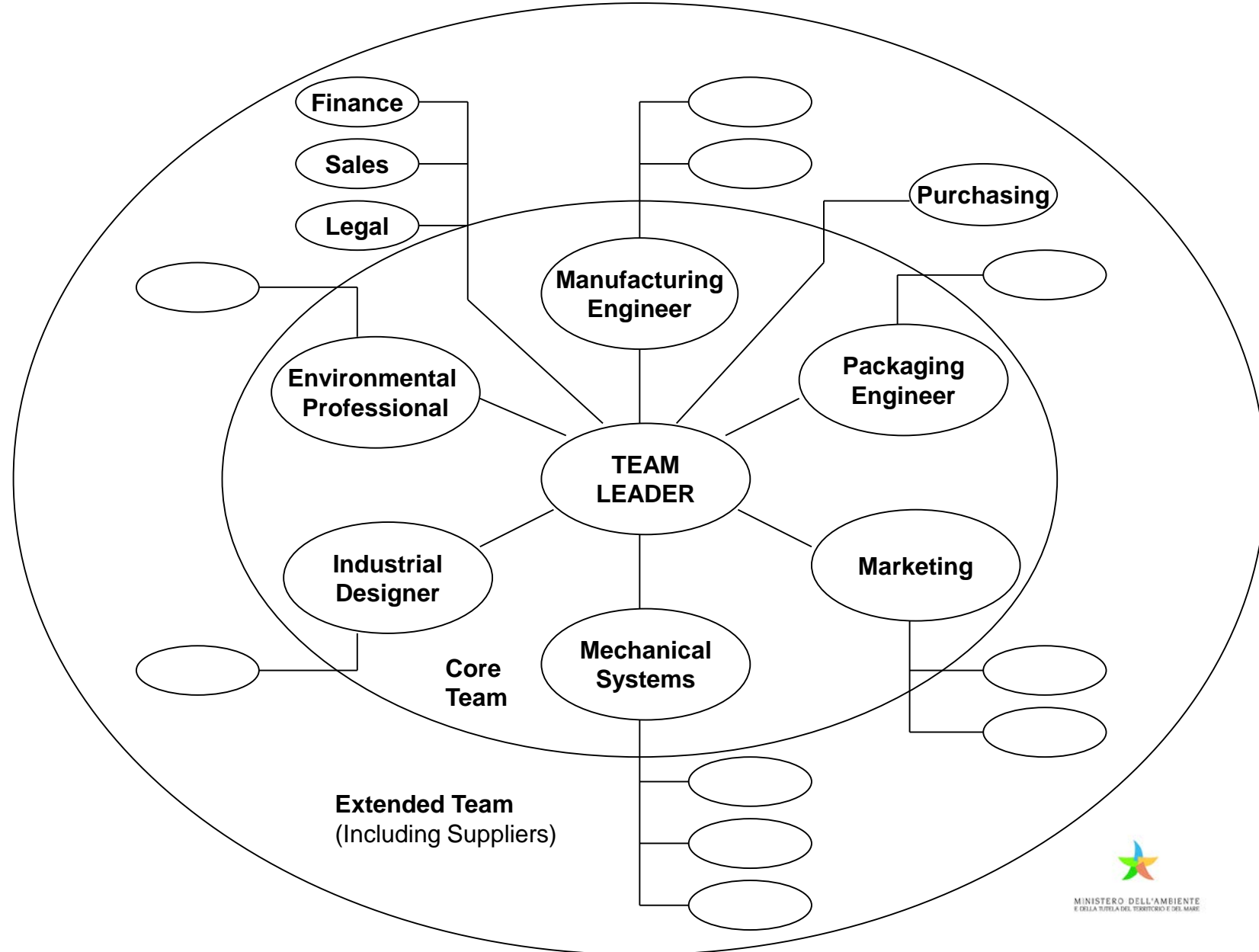
## 2) Optimizing multiple (sometimes competing) objectives



The theoretical basis for sustainability as a “triple-bottom-line” proposition is clear and widely-understood, particularly by students.

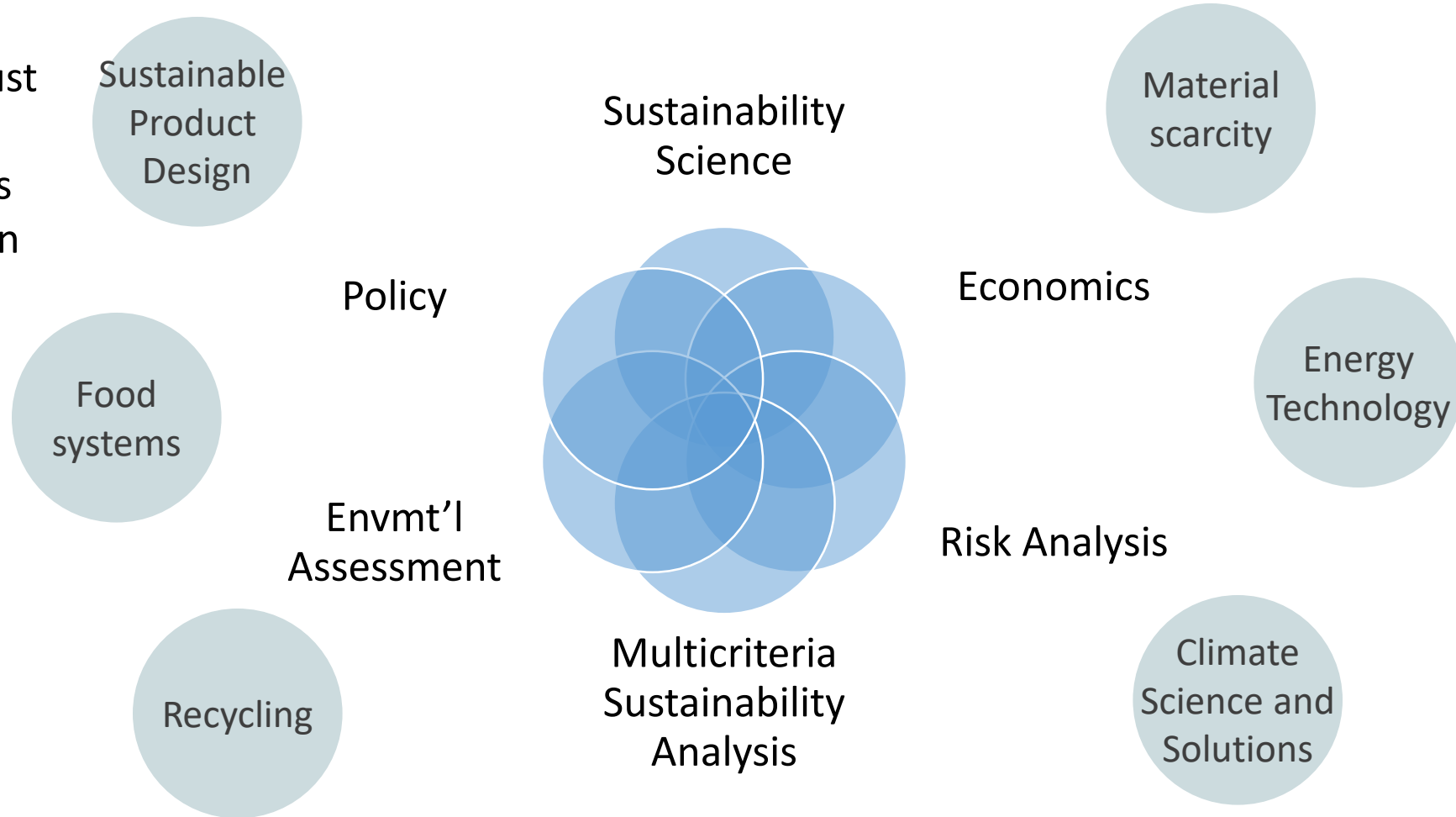
# Optimizing multiple (sometimes competing) objectives

The practical basis for making a business case for sustainability is a more challenging endeavor in the workforce, where graduates face new, unanticipated ideas and perspectives.



# Creating curriculum that develops capacity to inform multiple perspectives

Sustainability curriculum must cross-cut key methodologies and application areas:





# Engaging stakeholders within the campus “living laboratory”

Demonstrate and Validate New Technology



Facilitate Student Innovation and Entrepreneurship



Create Industry-University Partnerships

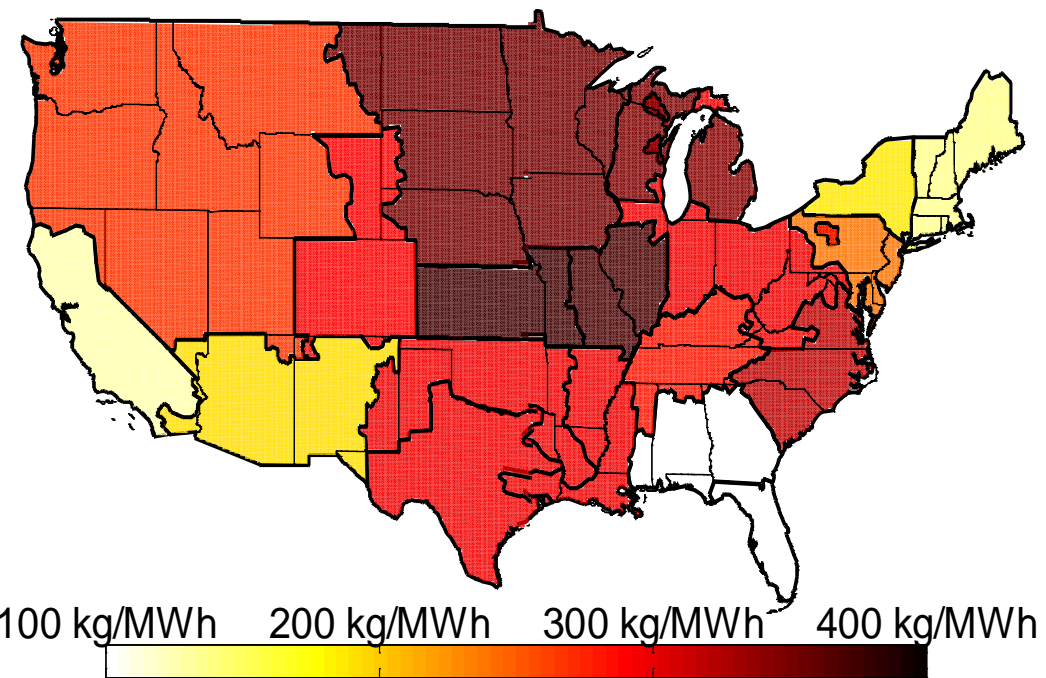


Test Green Infrastructure



### 3) Preparing to inform decisions that matter

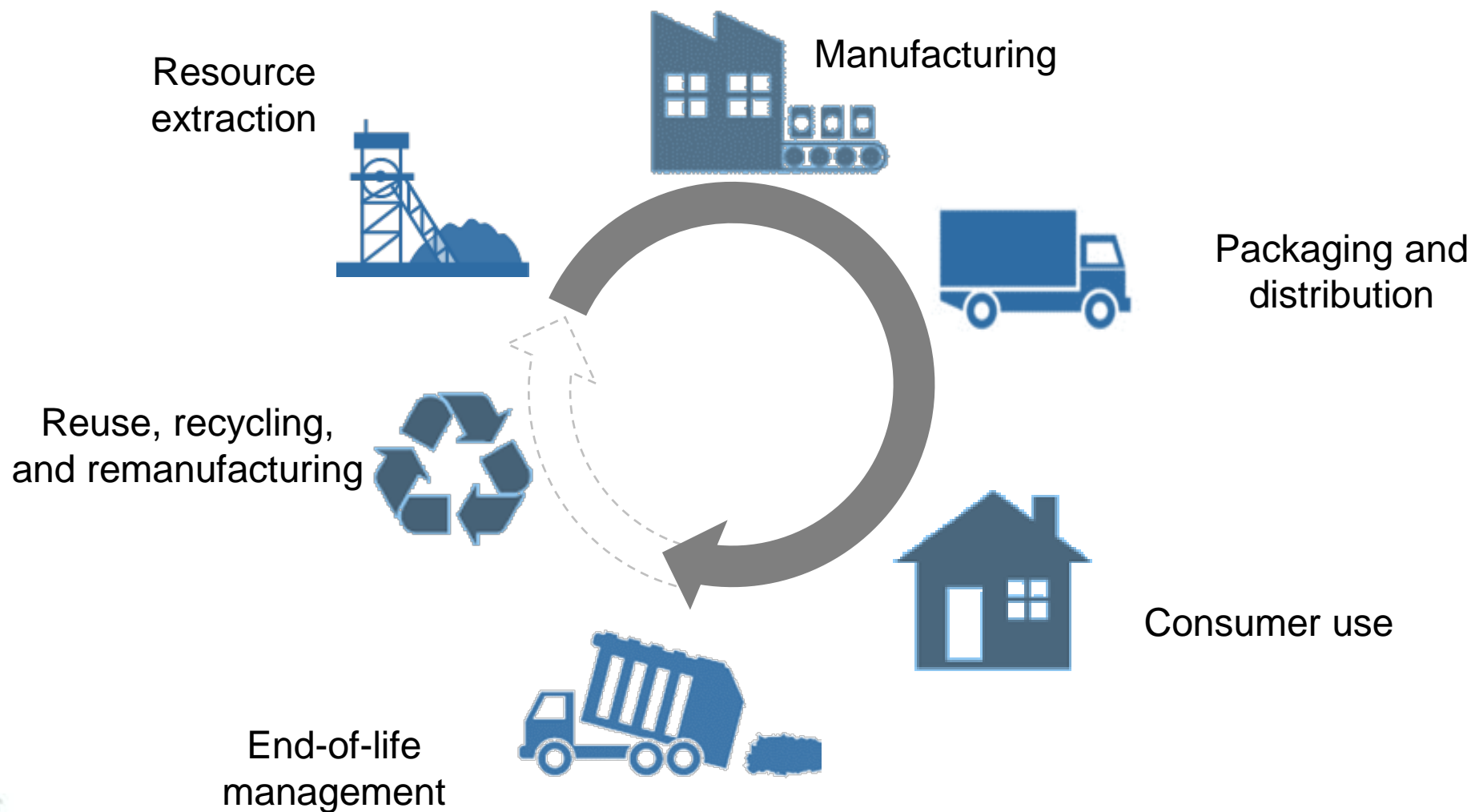
Solutions created without sustainability considerations often create a “ripple effect” of unintended consequences



For example: deploying energy storage to support renewable energy integration into the grid can potentially lead to net greenhouse gas emissions on a cumulative basis (Hittinger and Azevedo 2015)



# Systems approach and Life Cycle thinking are critical learning outcomes



# Educational outcomes should be measured by the impact of graduates who go on to create and deploy sustainability solutions



Commercializing new solar and battery technologies that are more efficient and have a smaller material footprint.



Bringing cost effective solar power, education, and professional job training to Native American tribes.



Educating the future workforce of sustainability professionals at K-12 and university levels



# Transformation of sustainability education requires broader changes within institutional culture



Linda Helton for The Chronicle of Higher Education

- Interdisciplinary teaching and research
- Mechanisms to incentivize and reward work outside of “silos”
- Novel, flexible curricular and degree models
- Organizational agility to respond to changing trends in higher education

