

# Closing the Loop: Pioneering Approaches to Circularity

**KC Morris, FSME**

National Institute of Standards and Technology (NIST)

Group Leader, Life Cycle Engineering

Director, ASTM E60 Sustainability Board



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# Circular Economy is the next sustainability paradigm

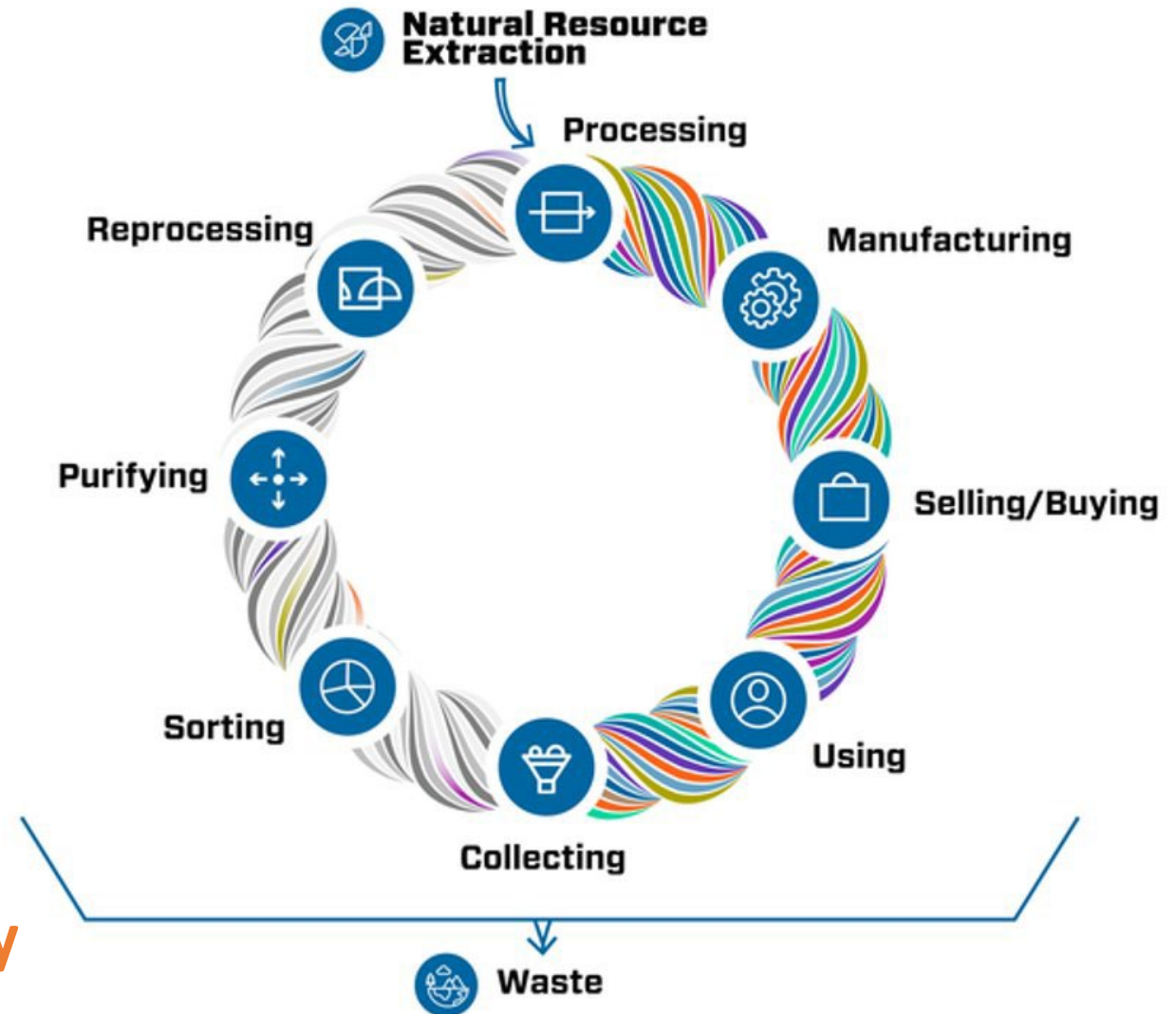
## Global Response to

- limited global resources
- growing population (7.9B and growing)
- rising middle classes

## Economic Model

- all materials are recirculated into the economy
- rather than landfill or atmosphere

<https://www.nist.gov/circular-economy>



# Pursued by Governments Globally

## US

- White House Office of Science and Technology Policy:
- Manufacturing US: REMADE Institute
- NIST Research Lab's CE program and other agencies
- Office of Federal Chief Sustainability Officer issues Buy
- Department of State engage in UN negotiations
- SEC rule requiring disclosure of climate-related risks

## EU

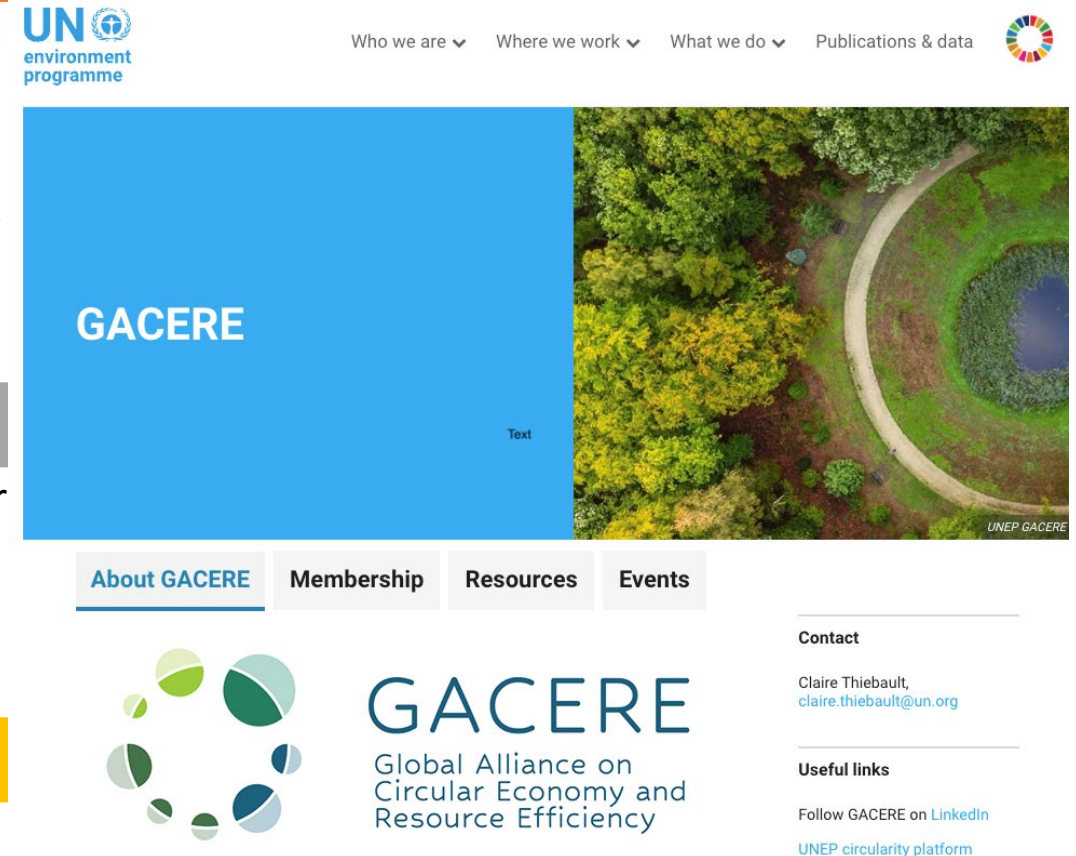
- Green Deal - No net emissions of GHG by 2050, Resour
- Circular Economy Action Plan (CEAP)
- Ecodesign Directive
- Digital Product Passports

## China

- **Development Plan for the Circular Economy**

## Others

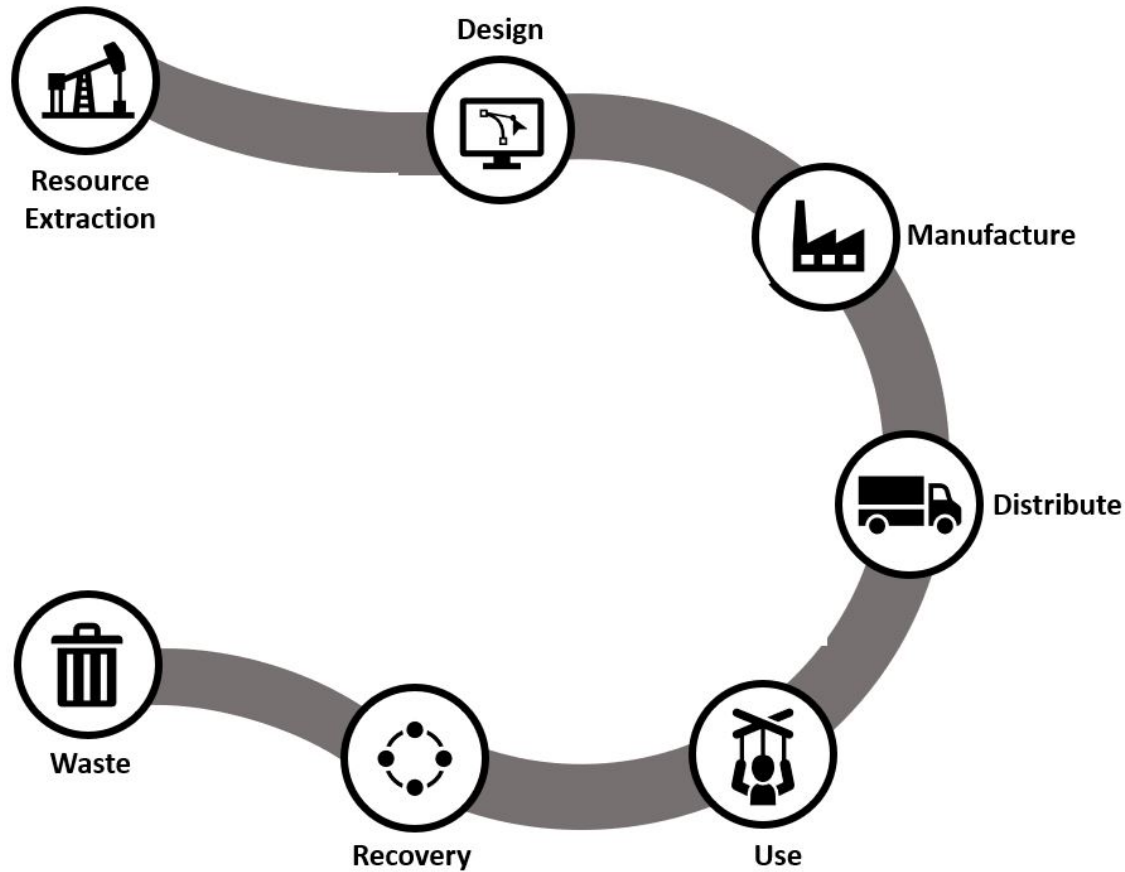
- [Canada](#), [Brazil](#), [Japan](#), and many others



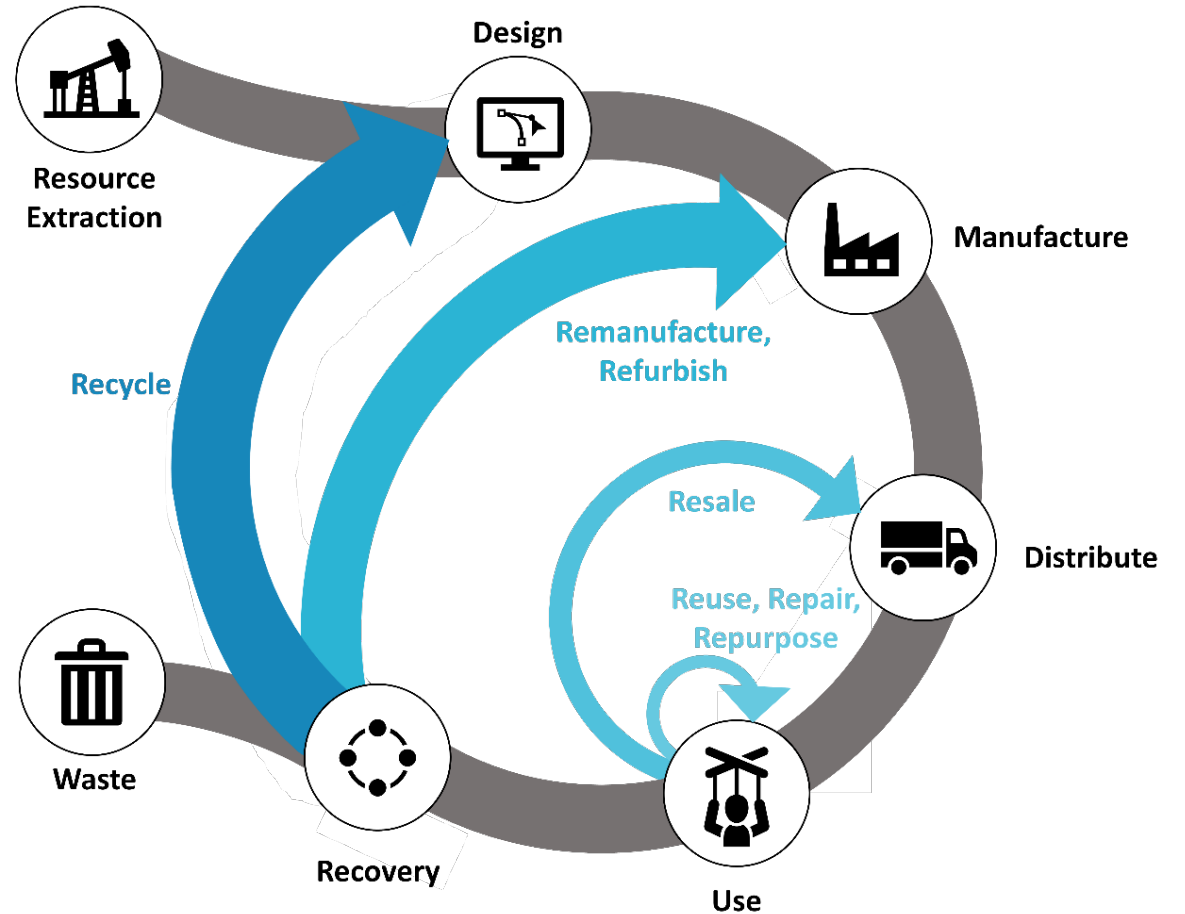


# Sustainable Production through a Circular Economy

## Linear economy

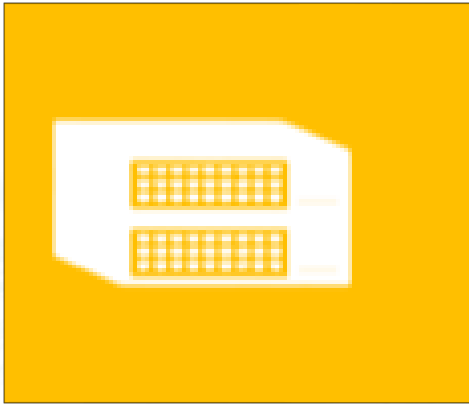


## Circular economy



# Measurement to Make Change: from Needs to Standards

## Stakeholder Needs



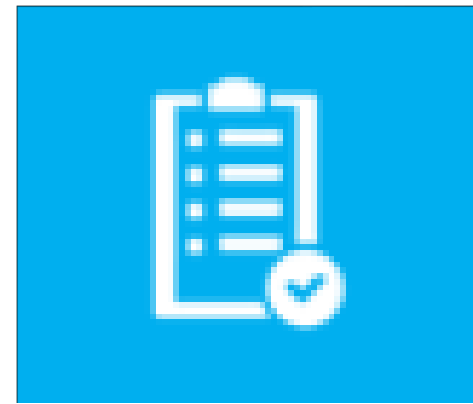
- Inspiration
- Shared vision
- Guidance

## Research Solutions



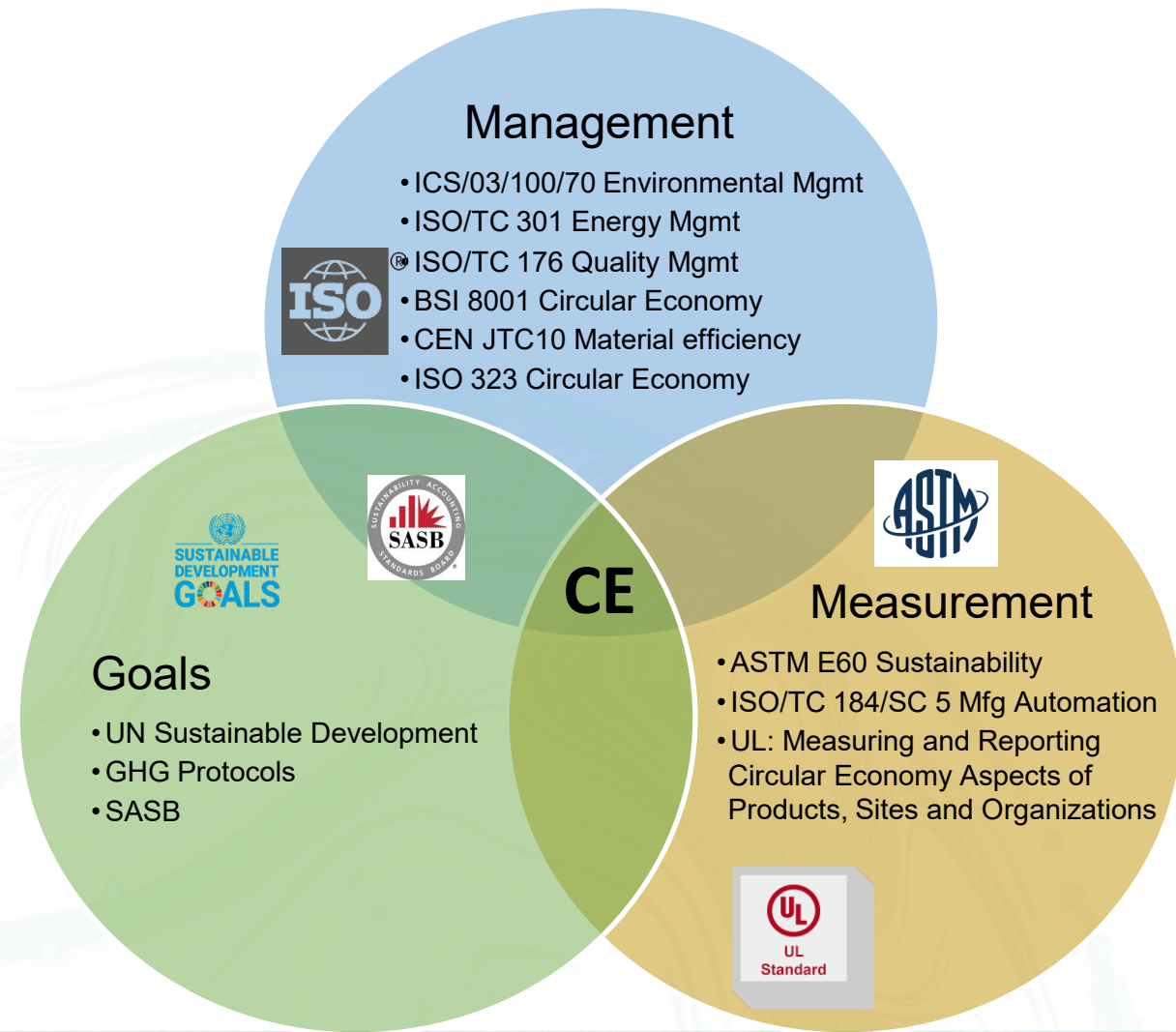
- Measure improvement
- Validate against goals
- Test accuracy and correctness

## Standards



- Establish stakeholder trust
- Communicate results
- Deploy at scale
- Situationalize deployment

# International Standards Efforts for Circular Economy



## ISO 323 Circular Economy

- 5 Working Groups on technical content
- 5 standards published
- 1 vote per country

## ASTM E60 Sustainability

- Standards Needs and Roadmap Reports:
  - Fostering a Circular Economy of Manufacturing Materials*
  - Decarbonization: A Gap Analysis of LCA Standards for Industry*
  - Standards Needs for Circular Textiles Workshop Report*
- **New Work Item in E60.13 Sustainable Manufacturing:**
  - Principles for Circular Product Design*
- 1 vote per organization

## UL Standards

- *Measuring and Reporting Circular Economy Aspects of Products, Sites and Organizations*
- Certifications evaluating product, facility, and company

## Others

- include technology, material, sector specific standards



# ISO 323 Publication dates

Standards	Publication
<b>ISO 59 004 – Circular Economy</b> – Terminology, Principles and Guidance for implementation	2024
<b>ISO 59 010 – Circular Economy</b> – Guidance on business models and value networks	
<b>ISO 59 014 – Environmental management and circular economy</b> — Sustainability and traceability of the recovery of secondary materials — Principles, requirements and guidance	
<b>ISO 59 020 - Circular Economy</b> – Measuring and assessing circularity	
<b>ISO 59 040 - Circular Economy</b> – Product Circularity Data Sheet	FDIS 2024
<b>ISO TR 59 031</b> – Circular Economy – Performance based approaches	TBD
<b>ISO TR 59 032</b> – Circular Economy – Review of existing value networks	TBD



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Moderator: **KC Morris**

**Buddhika Hapuwatte**, Ph.D.,  
ASTMCommittee E60 on Sustainability

**Jason Metnick**, Senior Vice President of  
Customer Affairs, Sustainable Forestry  
Initiative (SFI)

**Randi K. Myers**, Director, Standards Program,  
UL Standards & Engagement

