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# Rex L. LaMore Ph.D.

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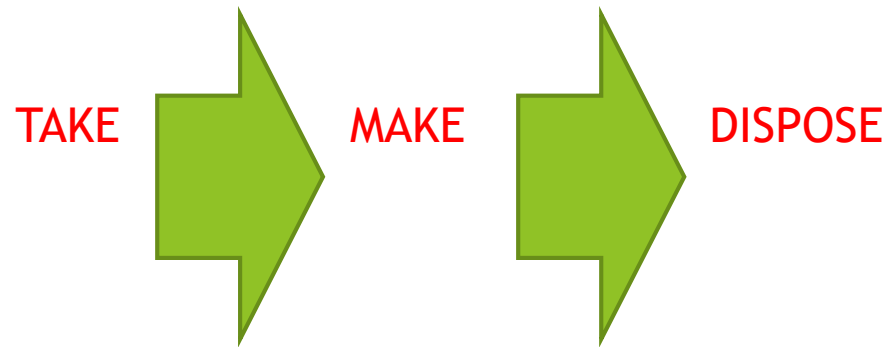
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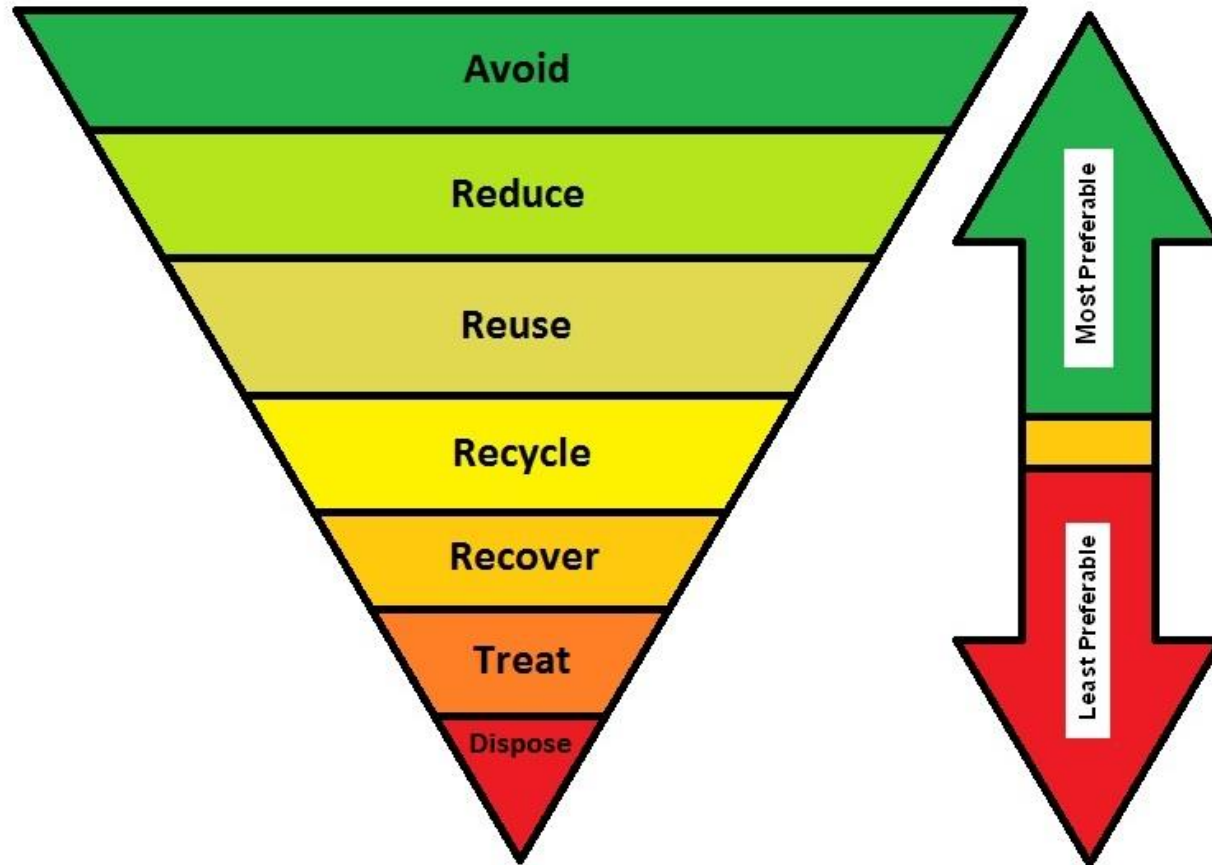
# Sustainable Supply Chain to Circular Economy

Transitioning from:



To a sustainable supply chain that embraces the concepts of a circular economy

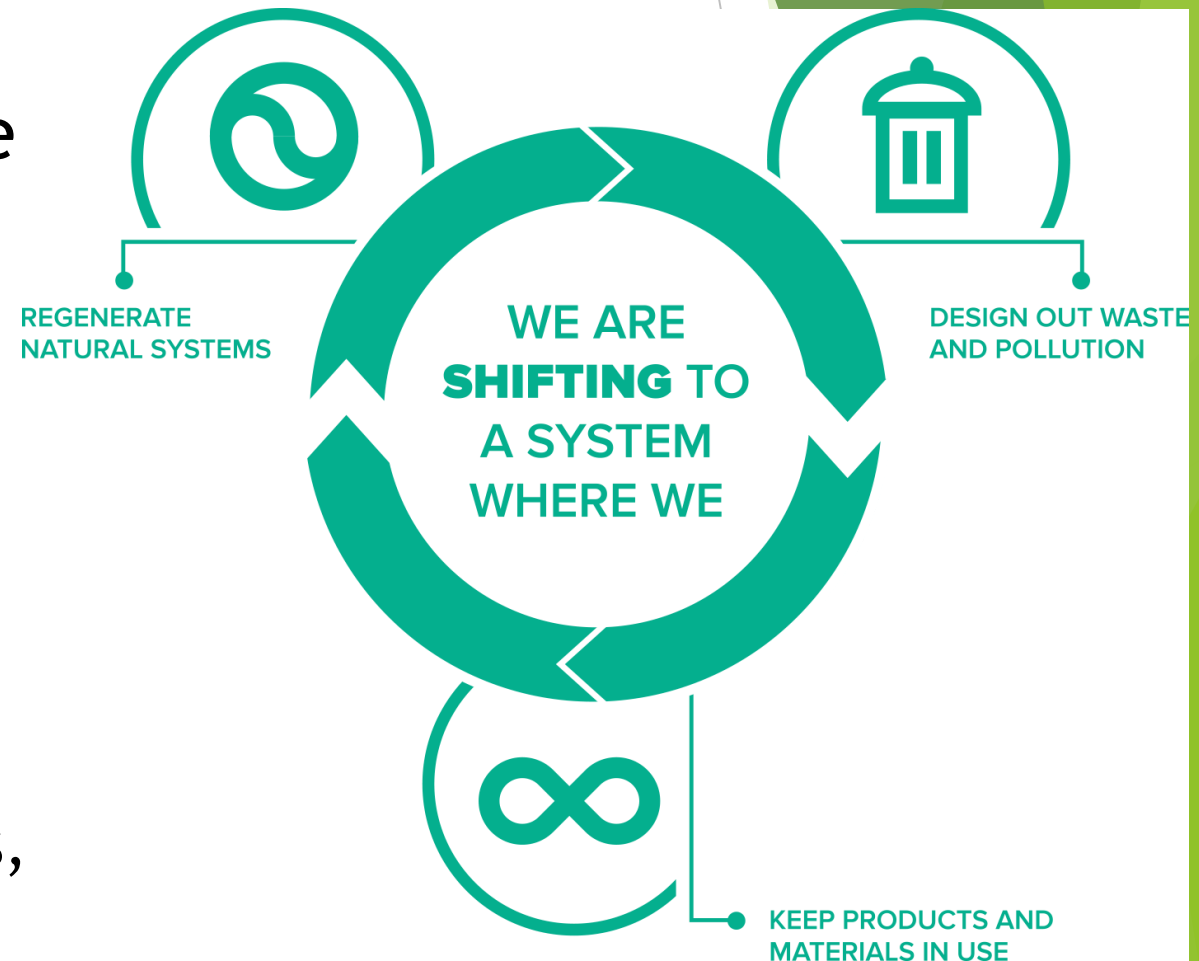
# Waste Hierarchy- a Sustainable Supply Chain



# IT'S CALLED THE CIRCULAR ECONOMY

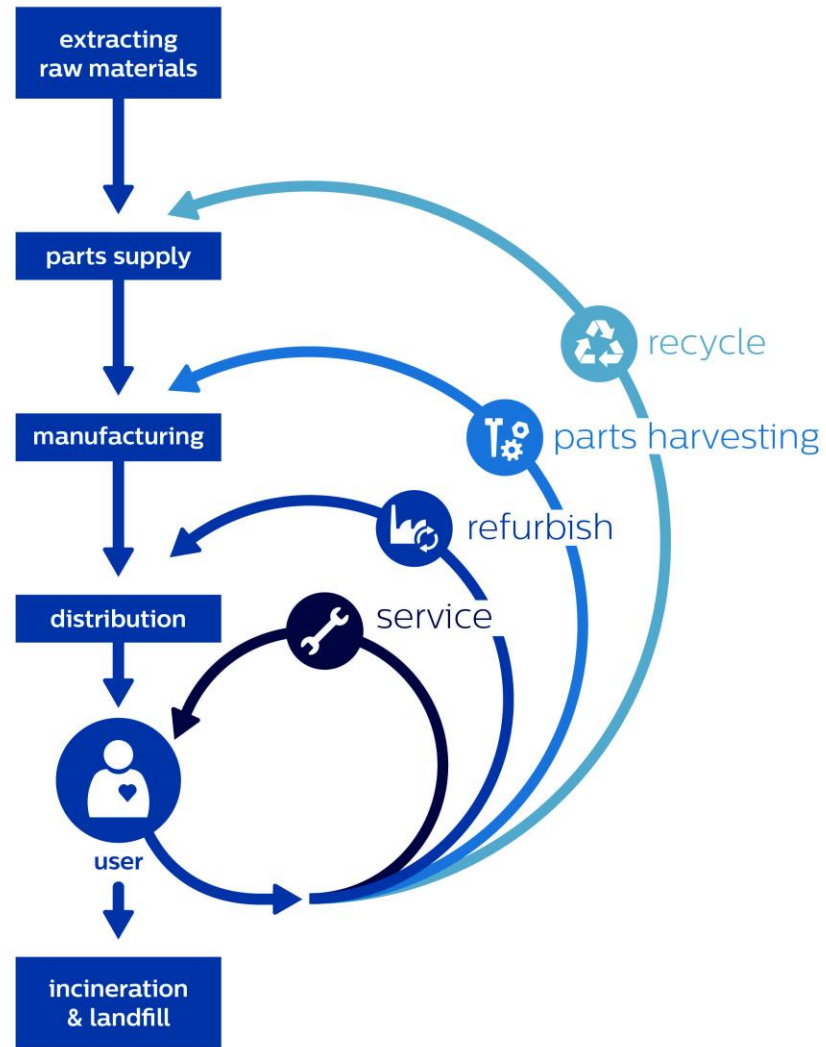
A circular economy is based on the principles of *designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.*

Shifting the system involves everyone and everything: businesses, governments, and individuals; our cities, our products, and our jobs.



Source: Ellen MacArthur Foundation

# the circular economy



Source: Philips (electronics such as toothbrushes, electronic razors, lighting, etc.)

# A Circular Economy Encourages:

- ▶ Sustainability and competitiveness in the long term.
- ▶ Preserve resources - including some which are increasingly scarce, or subject to price fluctuation
- ▶ Save costs for “U.S.” industries by reducing waste
- ▶ Unlocks new business opportunities (finding alternative design and new materials)
- ▶ Building a new generation of innovative, resource-efficient businesses - making and exporting clean products and services around the globe
- ▶ Creating local low and high-skilled jobs
- ▶ Create opportunities for social integration and cohesion through building industry networks and valuing what was previously wasted or abandoned.

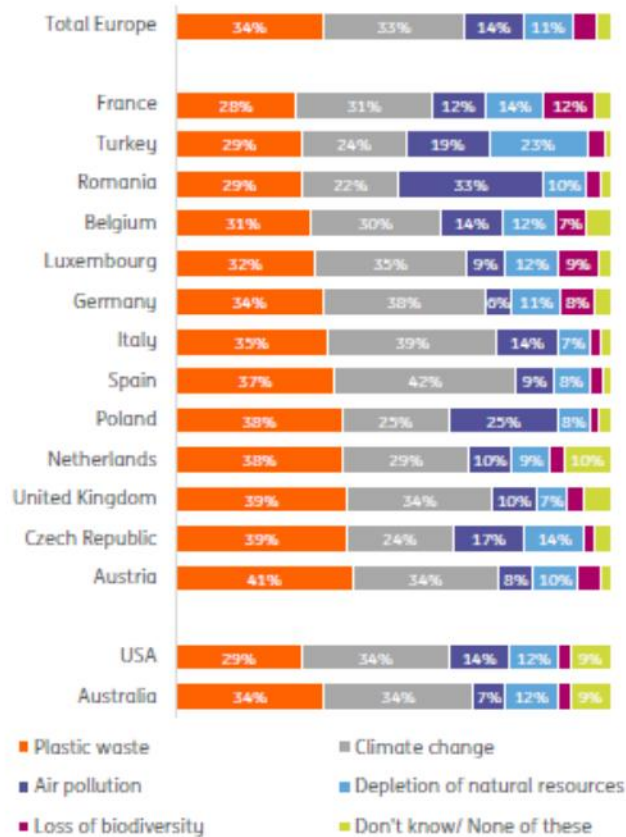
▶ [https://ec.europa.eu/growth/industry/sustainability/circular-economy\\_en](https://ec.europa.eu/growth/industry/sustainability/circular-economy_en)

# THE DRIVING FORCES IN A CIRCULAR ECONOMY

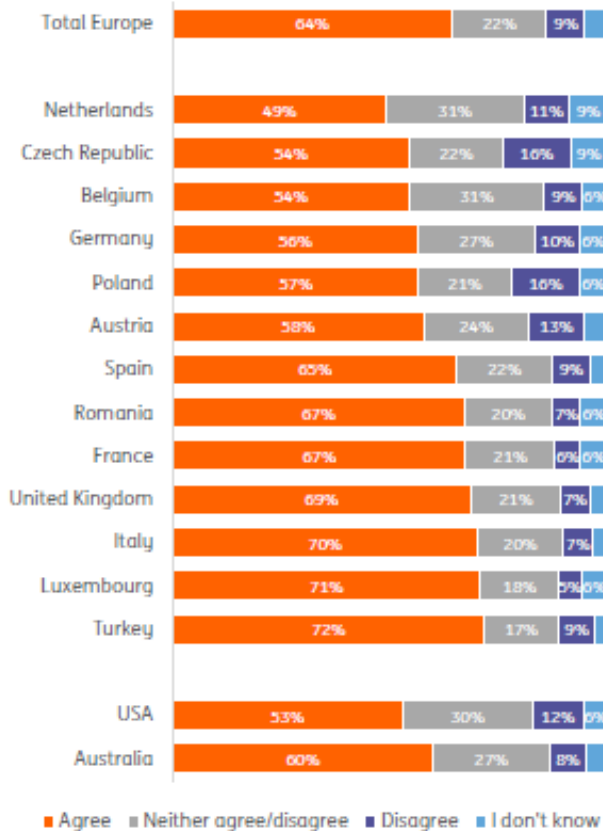
- ▶ Decouple economic growth from resource constraints
- ▶ Reduce negative environmental impacts
- ▶ Reduce product liability impacts
- ▶ Stimulate creativity in product design and reuse
- ▶ RESPOND TO GROWING CONSUMER DEMAND FOR SUSTAINABLE PRODUCTS
- ▶ INCREASE PROFITABILITY

# Attitudes Towards the Environment

What do you see as the most pressing problem for the environment?

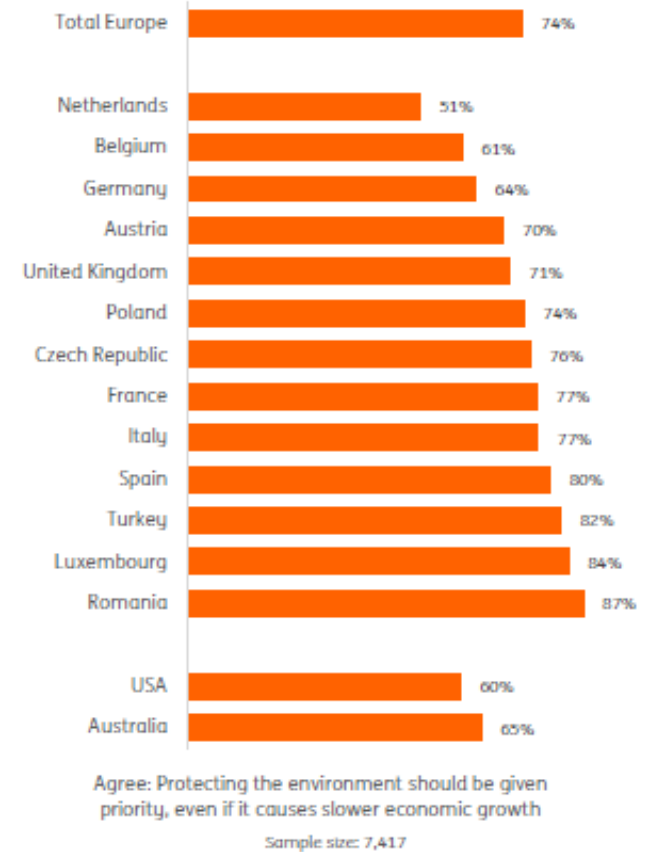


To what extent do you agree or disagree: companies will experience consumer backlash if they do not limit their environmental impact.



Asked to everyone.

To what extent do you agree or disagree with the statement: protecting the environment should be given priority, even if it causes slower economic growth.



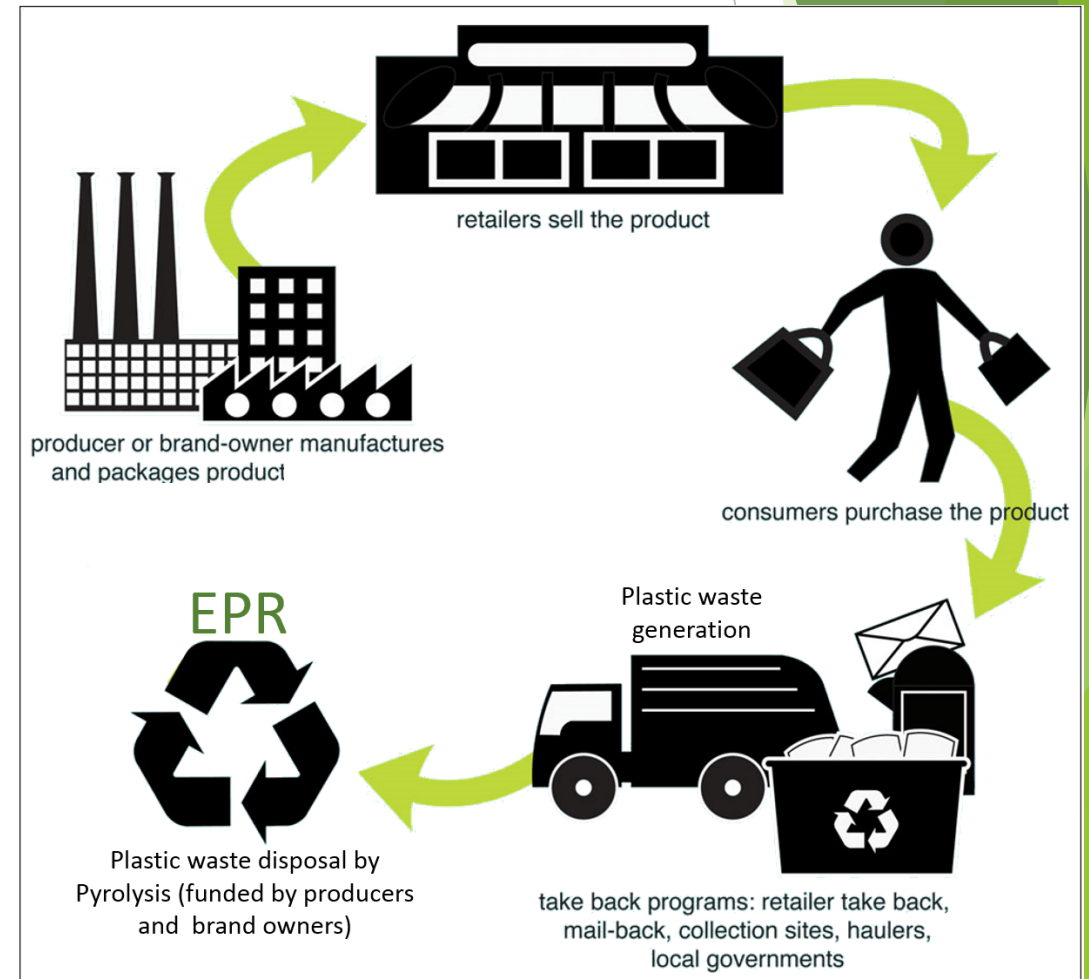
Agree: Protecting the environment should be given priority, even if it causes slower economic growth



# Extended Producer Responsibility: current practices vs EPR framework

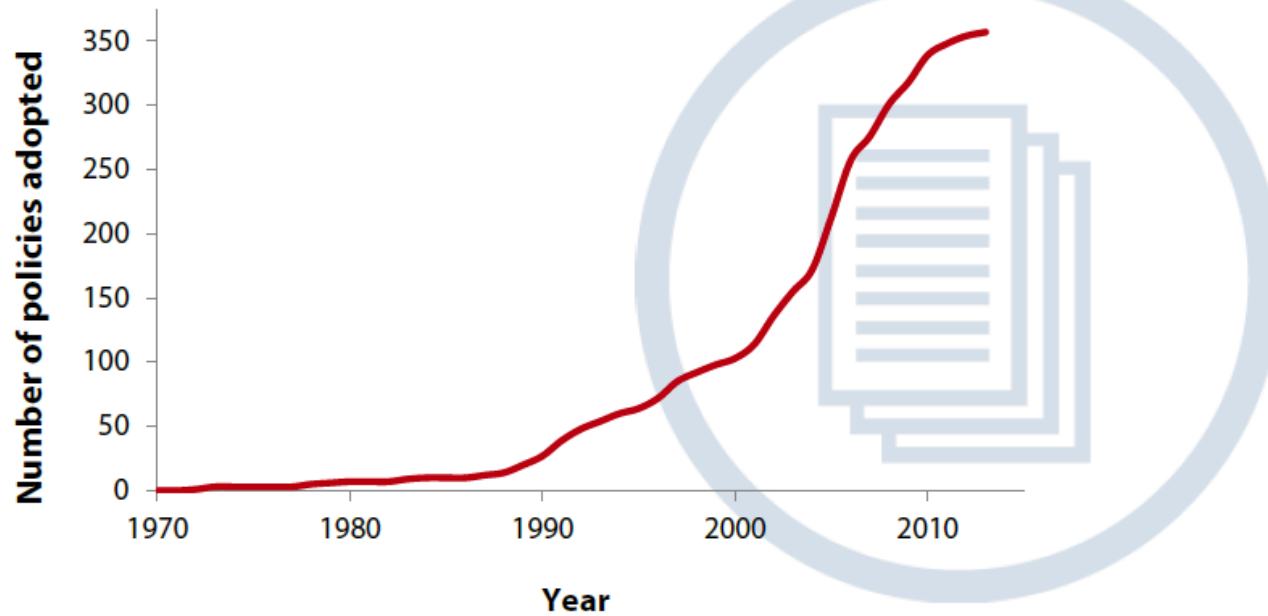


Source: Clean Water Action

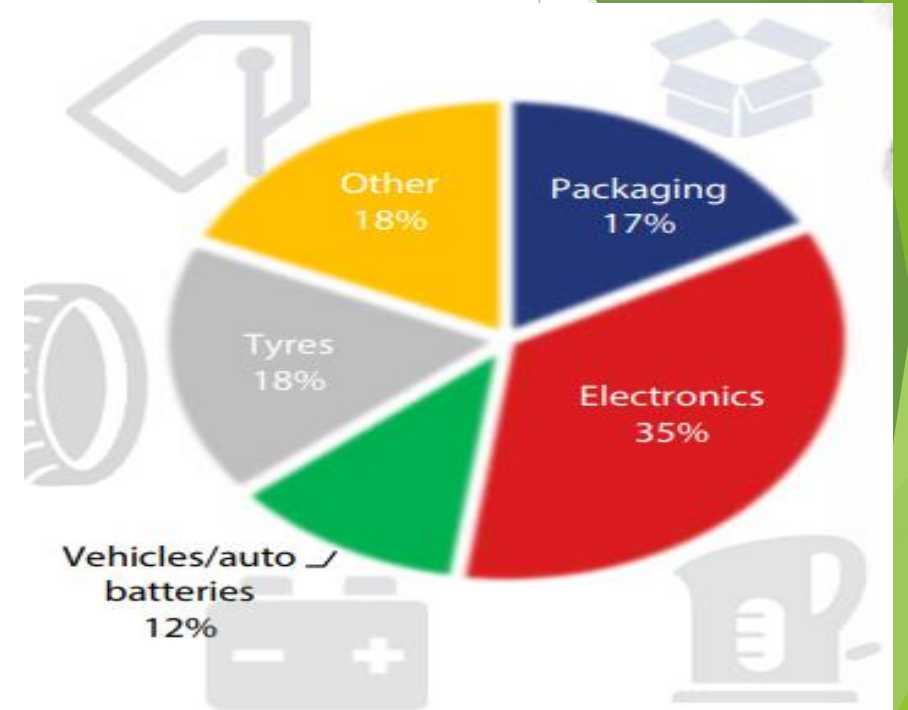


# Uptake of EPR Policies

Figure 1. Cumulative EPR policy adoption globally, 1970-2015



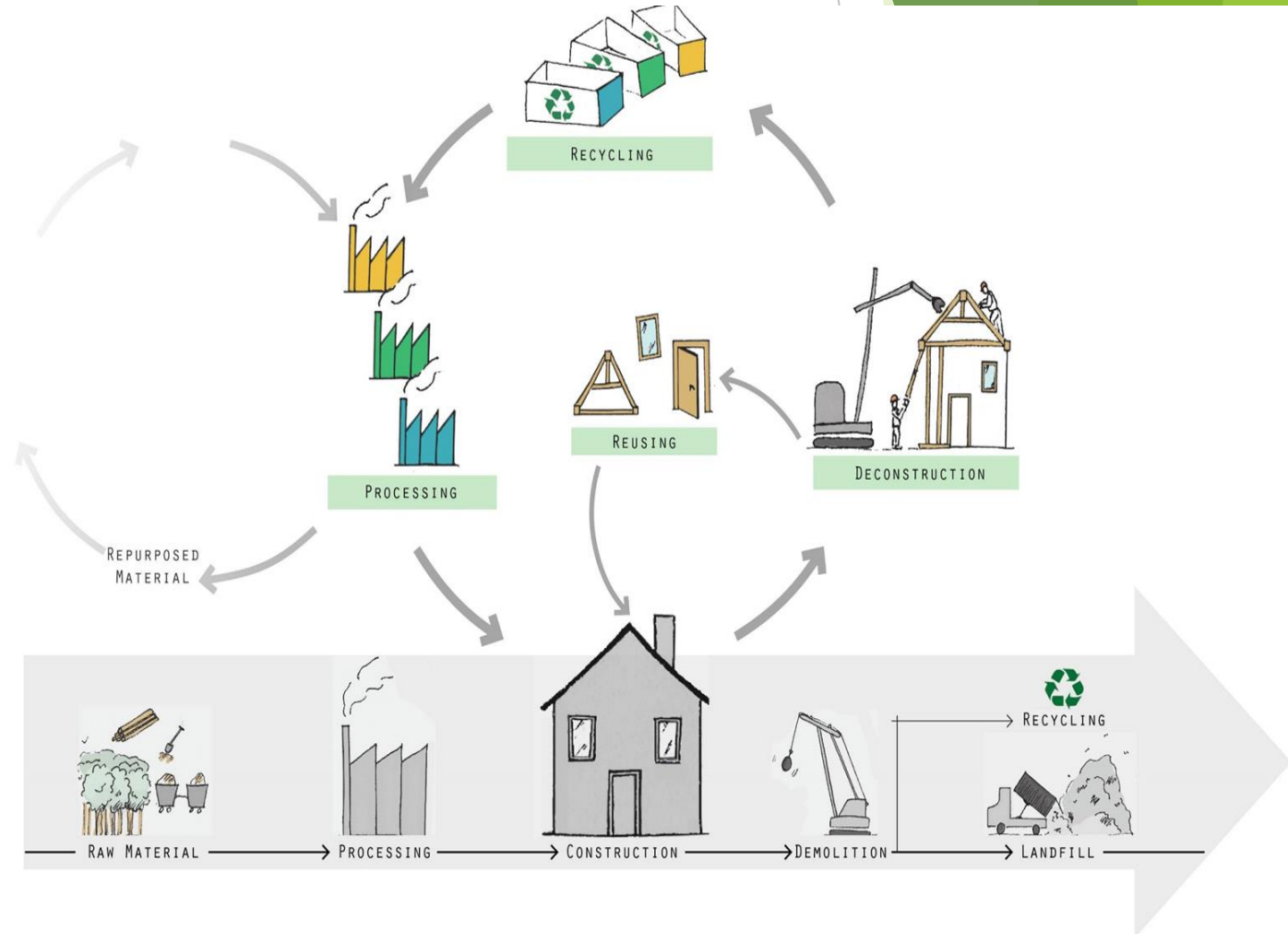
Source: OECD (2013), What have we learned about extended producer responsibility in the past decade? – A survey of the recent EPR economic literature, Paris.



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# Current Research and Outreach in a Circular Economy: Domicology

- ▶ Domicology is the study of structural lifecycles.
  - ▶ Domicology recognizes that structures have a life cycle
  - ▶ Plan, design, construct, and deconstruct
    - ▶ Maximize reuse of materials
  - ▶ Identify tools, models, policies, and practices that can encourage structural life cycle
  - ▶ Research on technical, economic, and policy challenges
  - ▶ Create jobs for vulnerable people and encourage business in distressed areas



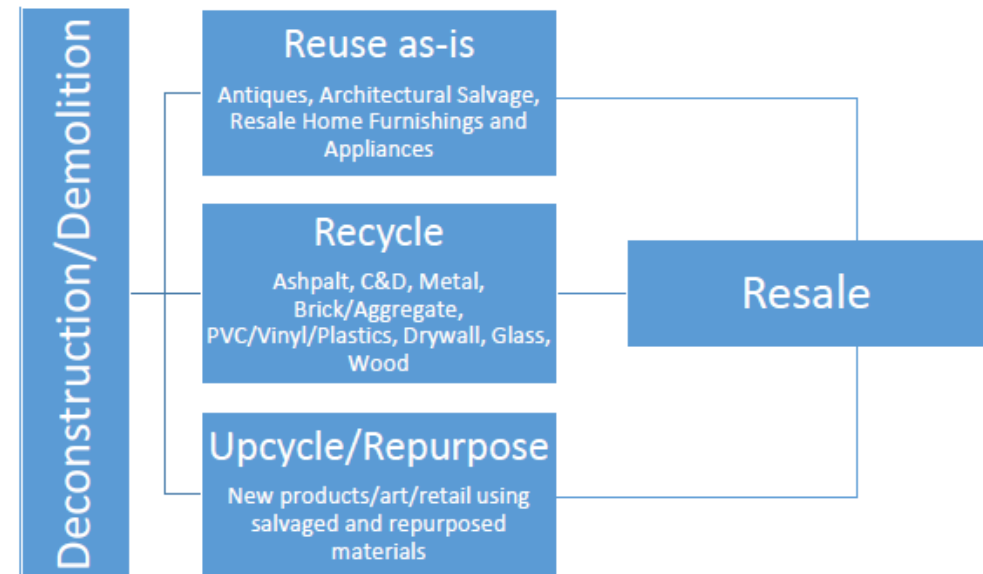
# CURRENT PROJECTS:

## Materials Salvage and Reuse Business Innovation Hub

The Domicology team at MSU with the support of the Michigan Department of Environment, Great Lakes & Energy (EGLE).

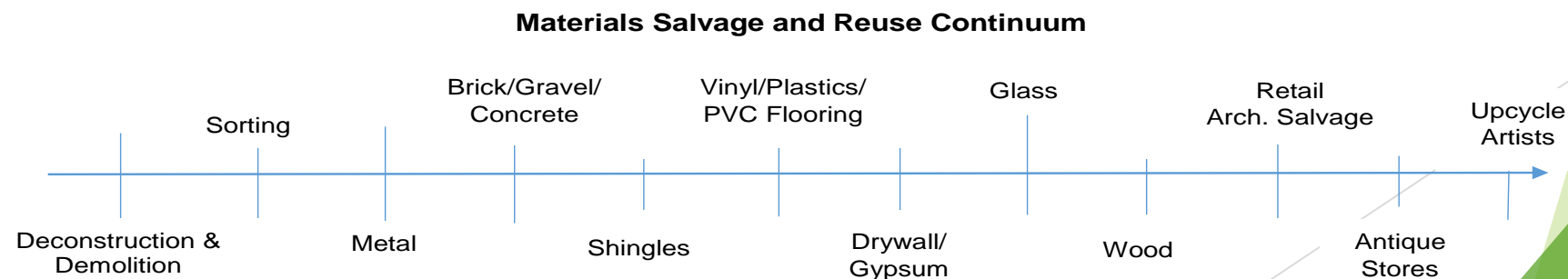
The project has **two primary objectives**:

- ▶ Conduct pioneering research on **value added reuses of salvaged wood (organic) products** present in abandoned structures
- ▶ Create a **statewide salvage/reuse business accelerator that will provide strategic training, technical assistance and networking** to improve the viability of this nascent industry sector and expand businesses' recycling markets for salvaged materials.



# Material Salvage and Reuse Innovation HUB:

1. Surveying businesses in the structural materials salvage and reuse sector to identify training and technical assistance opportunities and challenges
  - a) [https://msu.co1.qualtrics.com/jfe/form/SV\\_2r6lnuY0OqqA6B7](https://msu.co1.qualtrics.com/jfe/form/SV_2r6lnuY0OqqA6B7)
2. Conduct Training and Technical Assistance
  - a) Topical training sessions and webinars on relevant topics (marketing, inventory control, workforce training/recruitment/retention)
  - b) Technical Assistance Network (developing web-based platform to intake requests for services and support from businesses/stakeholder groups)
3. Student-lead, Faculty Guided Projects
  - a) Matching industry partners with Higher ed. student teams to investigate specific research questions
    - For example, possible reuses of roof shingles
    - Local government ordinances that strengthen the salvage and reuse sector



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