

# What is a “Circular Economy?” Concept and Practice

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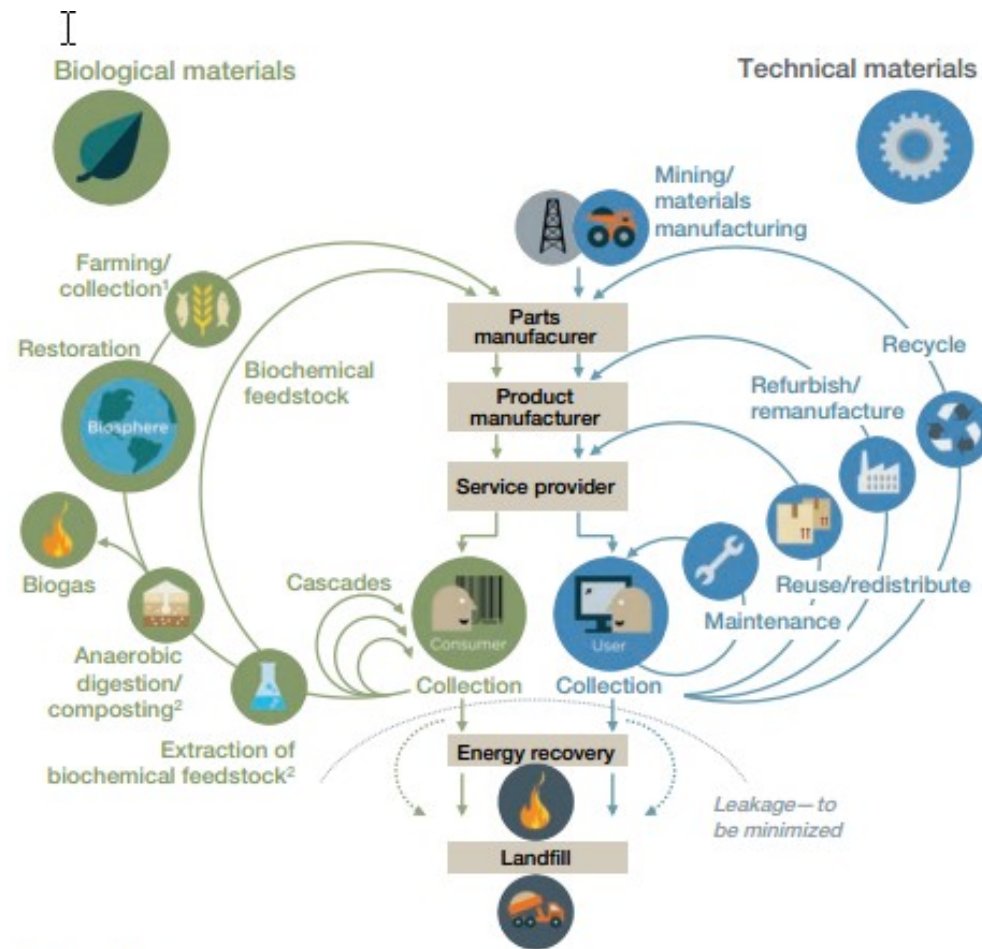
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# WEF and EMF Diagrams - Natural Mimicry



<sup>1</sup> Hunting and fishing

<sup>2</sup> Can take both postharvest and postconsumer waste as an input

Source: Ellen MacArthur Foundation circular economy team drawing from Braungart & McDonough and Cradle to Cradle (C2C)

# Design Imperatives

## Production

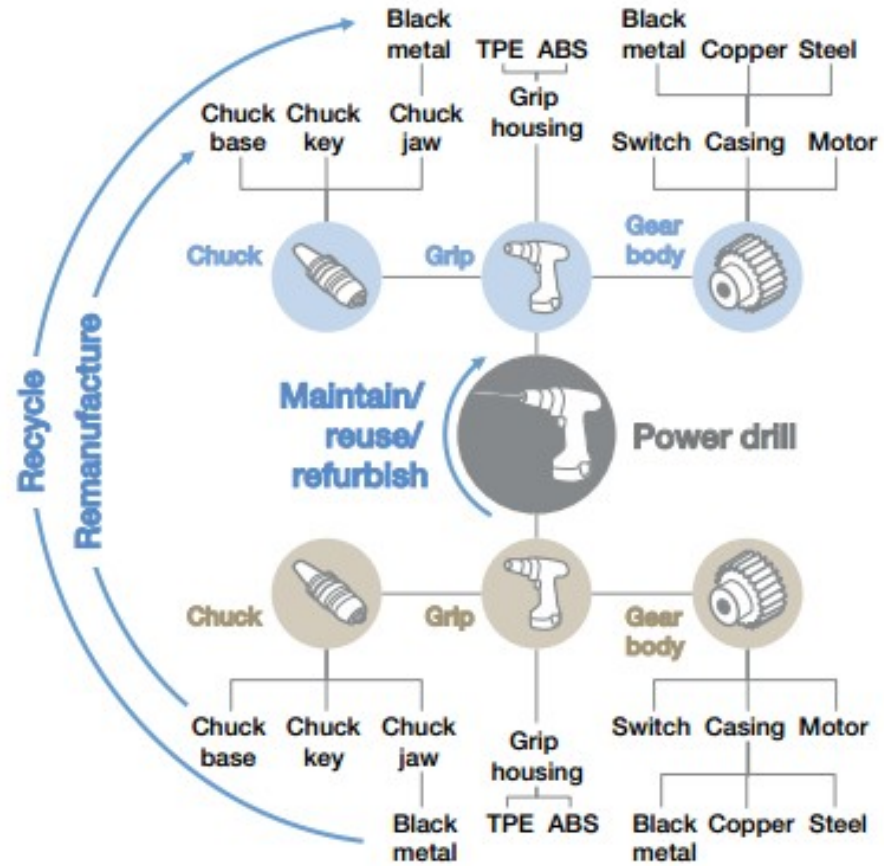
- Raw material
- Subcomponent
- Component

## Usage

Product

## Post-consumer

- Component
- Subcomponent
- Raw material



Source: Expert interviews; World Economic Forum and Ellen MacArthur Foundation circular economy team



Source: ESA

<sup>1</sup> <http://www.ellenmacarthurfoundation.org/business/ce100>

<sup>2</sup> <https://www.gov.uk/government/publications/resource-security-action-plan-making-the-most-of-valuable-materials>

<sup>3</sup> <http://www.green-alliance.org.uk/grea1.aspx?id=6571>

# Cautionary Note

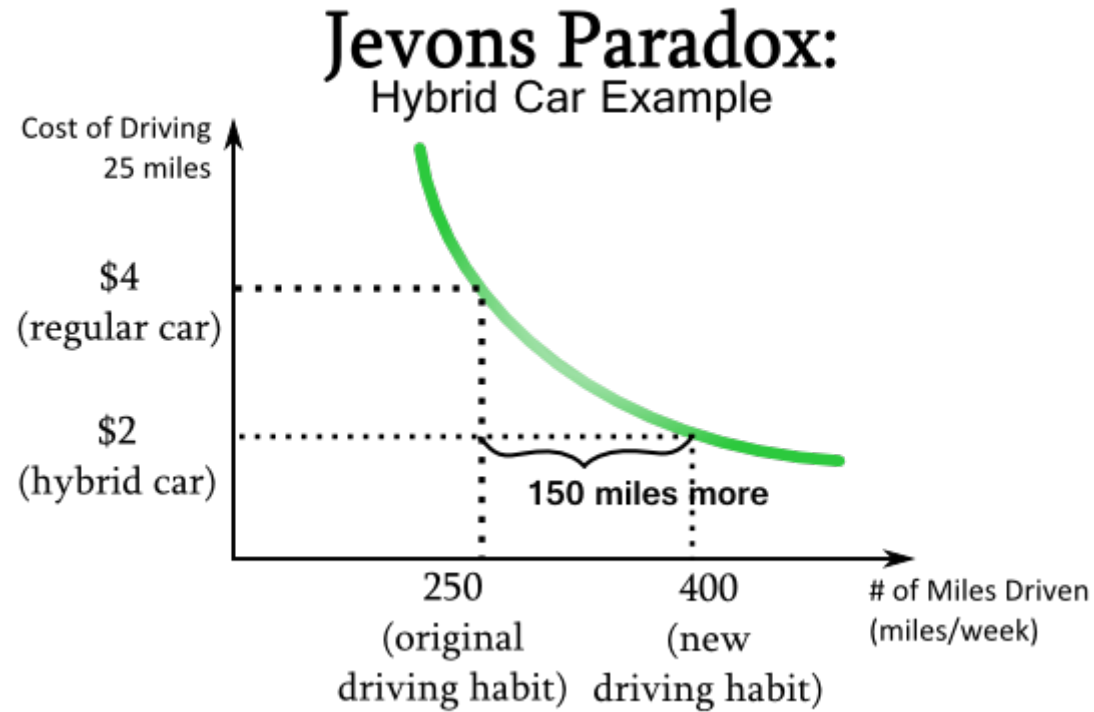


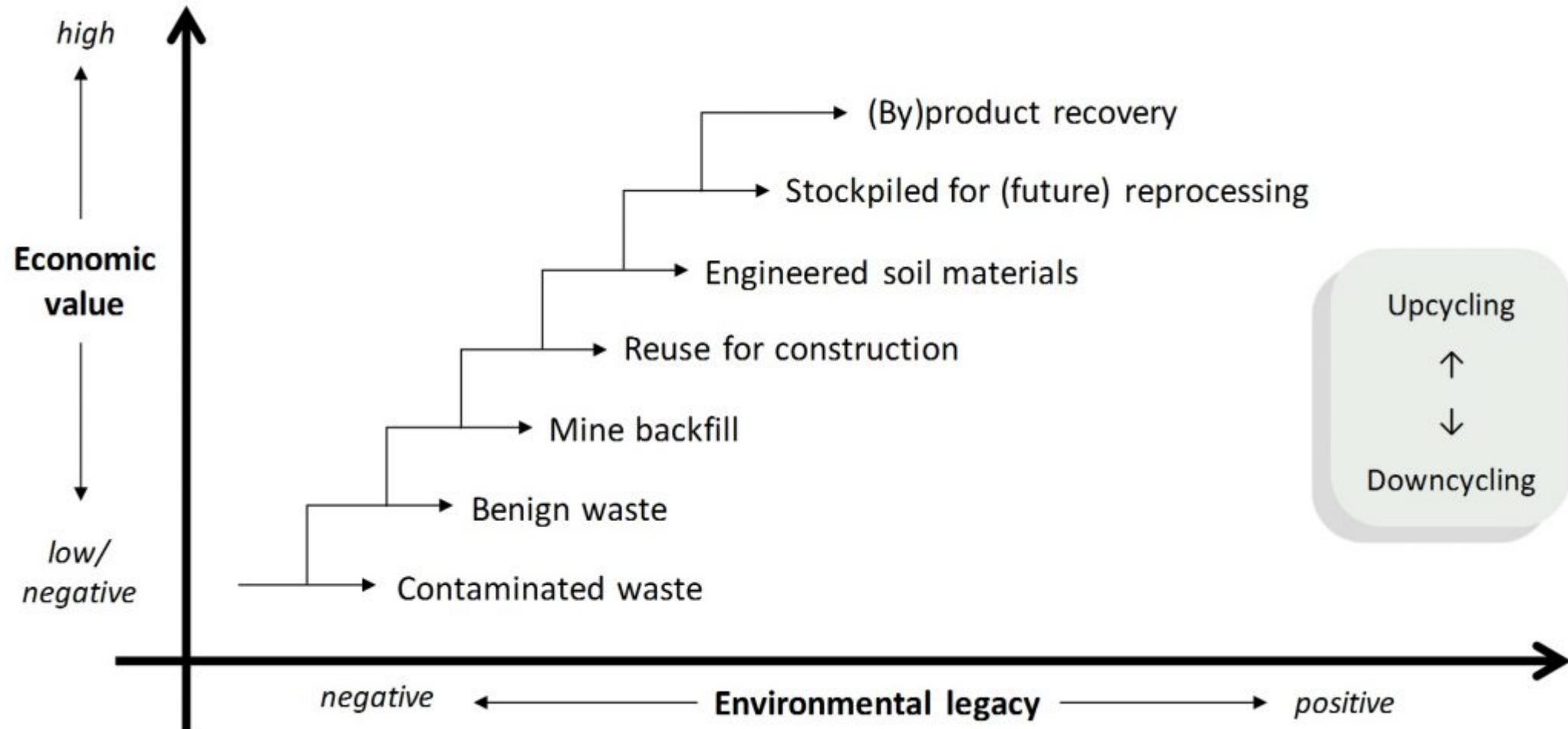
Diagram by Aaron J. Lin

# Mining and the Circular Economy

- Companies reinventing themselves as material service providers rather than ore extractors (aluminum industry is moving that way)
- Harnessing tailings as a resource from legacy sites
- Finding ways of using waste-rock more effectively for infrastructure
- Efficiency of water and energy usage (recycling water further)
- Non-combustible uses of coal – conversion to products which in turn can be recycled (graphite; recyclable carbon fibers)

# Value Chain Options for Mine Waste

(Artem Golev, University of Queensland)



# Coda

“That consumption is no longer restricted to the necessities but on the contrary, mainly concentrates on the superfluities of life harbours the grave danger that eventually no object of the world will be safe from consumption and annihilation through consumption.”

1958

Hannah Arendt, The Human Condition,