

The Circular Economy Operationalizes Sustainability

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February 23, 2016

The Circular Economy Operationalizes Industrial Ecology

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The Circular Economy Operationalizes the Next Generation of Environmental Law & Policy

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CE context

Today's **linear economy**—in which natural resources are extracted from the ground, made into products, used, and thrown away—has been highly successful in delivering economic development during the 20th century.

However, global trends indicate that the traditional, linear model's ability to produce economic growth is being increasingly challenged, ***prompting a search for alternative approaches that can work in the long term.***

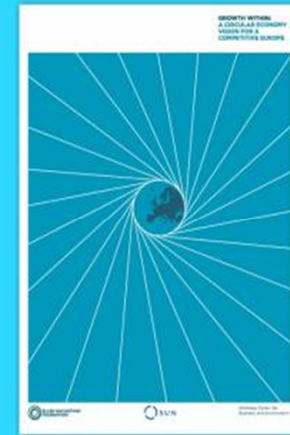
CE context

- With upward of 9 billion people on the planet by 2030 — including 3 billion new middle-class consumers entering the global market — the challenges of meeting **the increasing demand for goods and services will be unprecedented.**
- As documented by the Millennium Ecosystem Assessment and the Economics of Ecosystems and Biodiversity (TEEB) initiative, natural resources are being depleted at an accelerating rate, and **the ecosystems on which business and society depend are being degraded or destroyed.**

CE context

- Another feature of today's business landscape is the rising **volatility of commodity prices**, which can have a devastating impact on companies that, due to high fixed costs, rely on economies of scale.
- If we continue with the business-as-usual approach, companies and society will witness a probable surge in price volatility, inflation of key commodities, and an overall decline—and in some cases, depletion—of critical material inputs.
 - Between 2002 and 2010, **commodity prices rose more than 150%, erasing average price declines over the past century.**

Ellen MacArthur Foundation



- Series of reports beginning in 2012
- Most recent release February 2016

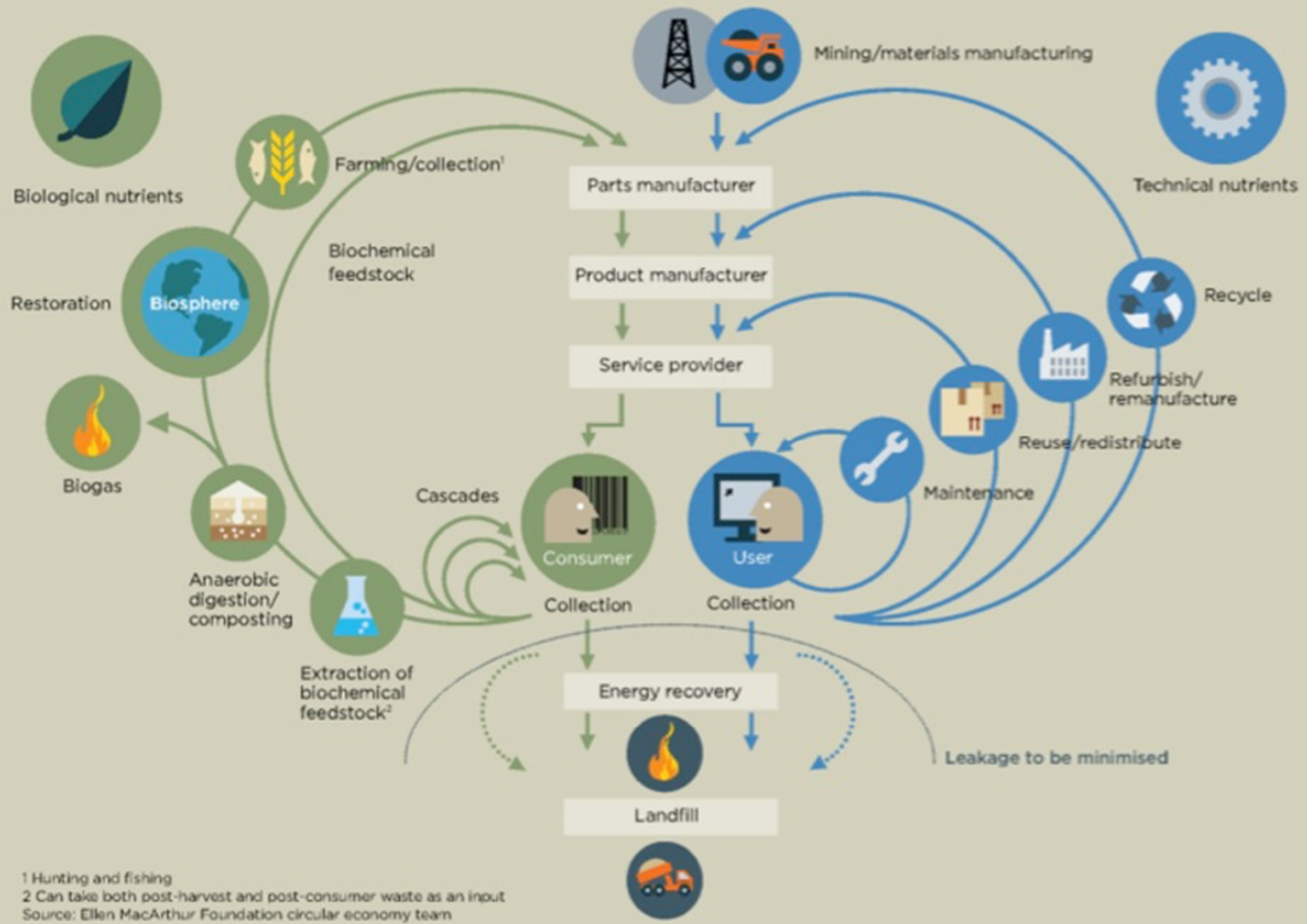
CE – the Basics

- Preliminary research shows that moving in the direction of a circular model could lead to significant economic benefits for specific industries:
 - It could move more broadly to help mitigate aspects of the current system that put pressure on resource supply, commodity prices, and volatility.
 - It also could restore the natural capital that is essential for the continual provision of food, feed and fiber.

CE -- the Basics

- The Circular Economy framework has been gaining traction around the world in recent years
 - business benefits
 - positive societal and environmental impacts.
- This concept has captured the attention of many companies that see the economic opportunities of a viable model to:
 - successfully tackle sustainability challenges;
 - drive performance, competitiveness, and innovation;
and
 - stimulate economic growth and development.

FIGURE 6 The circular economy—an industrial system that is restorative by design



CE – the Basics

- A CE system is **regenerative and restorative** by design...
- ... and primarily relies on optimizing two distinct material flows: biological and technical.
 - Products and services in this model are designed to enable efficient circulation, with **biological materials** returning to the food and farming system (thus rebuilding natural capital), and **technical materials** being kept in production and use loops without loss of quality.

CE – shortest definition

- A circular model generates new revenue streams and maximizes asset utilization while ensuring, as leading Performance Economy thinker Walter Stahel puts it, that the ***“goods of today become the resources of tomorrow, at yesterday’s prices.”***

CE – the Basics

- The Circular Economy is an industrial model that is restorative or regenerative by design and intent: **products, components, and materials are kept at their highest value at all times.**
- It is a system geared toward **designing out waste:**
 - use as few resources as possible in the first place,
 - keep those resources in circulation for as long as possible,
 - extract as much value from those resources, and then
 - recover and regenerate those materials and products at the end of their useful life.

CE – the Basics

- When shifting from linear to circular approaches, the **rule for optimization** is: the tighter the reverse cycle, the less embedded energy and labor are lost, and the more material is preserved.
- **Circular design** means: Improvements in material selection and product design using standardization, modularization, pure material flows, and design for easier disassembly.
- **“Efficiency versus effectiveness”**

Is CE simply Recycling on steroids? No.

- Corporate Social Responsibility (CSR)
- Sustainable business practices

- Ecosystem services
- Natural capital

- Product take-back; design for remanufacturing
- Cradle-to-cradle, life cycle
- Biomimicry

- Eco-industrial parks, industrial ecology, closed loop manufacturing

- The “sharing economy”
- Product-service systems

- Information technology
- Consumer behavior

US Chamber Foundation



CE – Corporate leaders



Hewlett-Packard

SUNPOWER®

PHILIPS

sense and simplicity

 **Tetra Pak**

More than the package™

Law and Policy Implications

- In China, learning from pilot projects on three different levels:
 - the **micro level**, which covers single enterprises in high-resource-consumption and high-discharge industries and waste-recycling enterprises.
 - the **meso level** and is represented by eco-industrial parks and symbiosis.
 - the **macro level**, involving cities and regions, including some resource-dependent areas in the central and western regions, and even large cities with scarce resources like Shanghai and Beijing.

Law and Policy Implications

- China's Circular Economy Law
- EU's Europe 2020 strategy and related policies
- Challenges in the US market:
 - everything from production economics and contracts to regulation and mindsets favors the linear model of production and consumption
 - cultural resistance, to subsidized commodity and energy prices
 - new frameworks in terms of corporate governance, cross industry cooperation, new technology and/ or regulation

A Circular Future?

A shift toward the circular economy could generate, by 2025, an estimated \$1 trillion annually in economic value, create more than 100,000 new jobs, and prevent 100 million tons of waste within the next five years, while restoring the natural capital and ecosystem services that are the foundation of healthy societies and economies globally.

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- Any system based on consumption rather than on restorative use of nonrenewable resources entails significant losses of value and negative effects all along the material chain.
-
- Leaders are in search of a better hedge and an industrial model that decouples revenues for material input: the circular economy.
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- The circular economy replaces the end-of-life concept with restoration, shifts or the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models.