

# Circular Economy

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This contribution features the submission of one of the most important sustainability keywords to Springer's Encyclopedia of Sustainable Management. It provides a definition and an introduction to the circular economy (CE). It describes key policies and regulatory interventions that are meant to promote the CE agenda. In conclusion it identifies implications to practitioners and other stakeholders.

## **Definition**

A circular economy is a clean production system designed to minimise the use of resources in production systems and to reduce unwanted externalities from manufacturing processes including waste, emissions, and energy leakages. Such a sustainable approach differentiates itself from linear economic approaches that are built on the premise of “take-make-consume and dispose” actions (Camilleri, 2019; EU, 2014), that presume that resources are abundant, available, and cheap to dispose of.

The circular economy can be achieved by repairing, reusing, remanufacturing, refurbishing, and recycling resources that were already use during production, whilst safeguarding the natural environment through long-lasting closed loop and product service systems (EMF, 2013). This system balances the economic development with environmental and resource protection. It leads to higher operational efficiencies through responsible production and consumption behaviours (UNEP, 2006).

*Keywords:* Circular Economy, Sustainable Production, Sustainable Consumption, Resource Efficiency, Recycling, Closed Loop Systems, Product Service Systems.

## **Introduction**

Prior to the industrial revolution, business and industry would hardly dispose of their waste and by-products. In many cases, they reutilized and recycled their waste as it was too costly for them to dispose of unwanted materials and/or to convert them into reusable goods. However, over the years, particularly in the last century, several manufacturers have changed their manufacturing approaches and resorted to large scale production of disposable items. As a result, they created demand for the world's resources, caused pollution problems and generated more waste.

The growing populations and their increased wealth lead the exhaustion of the world's resources, to greater demands for products or materials, that have to be disposed once they have been used. Most of the unwanted items will inevitably finish in landfills and could pose serious health risks to flora and fauna.

In addition, the incineration of waste products increases the concentrations of residual toxic metals which may in turn contaminate air and seep into groundwater, thereby contaminating such a critical resource for living ecosystems, including for humanity. The burning of fossil fuels, petroleum, coal and natural gas are undermining the ability of the eco-systems to support human life. Simultaneously, other anthropogenic causes including industrial and consumption practices have led to greenhouse gas emissions, the warming of the earth's climate, on-going land degradation and to the disappearance of arable land and desertification.

For example, plastic waste dumped into the oceans has formed a large plastic island in the Pacific Ocean. A specific area known as "Great Pacific Garbage Patch" is responsible for the deaths of

millions of tonnes of fish, seabirds and sea mammals (NOAA, 2022). These are some of the detrimental effects resulting from industrial activities.

In the light of these latest developments in the natural environment, the circular economy systems could help to restore our planet. The idea of a circular economy is essentially based on three principles: the elimination of waste and pollution, the circulation of products and materials (at their highest value), and the regeneration of nature (Ellen MacArthur Foundation, 2013). Hence, it requires a transition to renewable energy and to the recycling of materials.

A circular economy system aims to decouple economic activity from the consumption of the planet's finite resources and to using resources more efficiently. Therefore, it requires better eco-designs, waste prevention measures and the reutilisation and recycling of materials. Not only will such improved design and recycling result in better environmental outcomes but could also improve the businesses financial performance (Camilleri, 2020; Stahel, 2016; Van der Linde, 1995).

### **Key policies and regulatory interventions**

In the last twenty years, a number of intergovernmental institutions including the United Nations Environment Program (UNEP) and the European Union (EU), among others, as well as a number non-governmental organizations and academia, among other stakeholders, started raising awareness on sustainable production and consumption of resources (Camilleri, 2020; EMF, 2013; Lieder and Rashid, 2016).

The UN Report of the World Summit on Sustainable Development in 2002 added reference to unsustainable patterns of production and consumption. In the report, UN member states were urged to manage their natural resources in a sustainable manner, with lower negative environmental impacts. They were urged to promote conservation, biodiversity and sustainable use of ecosystems, while reducing waste (WSSD, 2002, p. 13). In another resolution entitled; “The future we want,” the General Assembly reaffirmed its commitment to green economy policies in the context of sustainable development.

In voting in favour of that resolution, governments committed to continuing to promote and to integrate policies supporting sustainable management of ecosystems, including their conservation, regeneration, and restoration of resources (UNCSD, 2012). In 2015, a General Assembly Resolution 2015 titled “Transforming our world: the 2030 Agenda for Sustainable Development,” was put to the floor. World leaders adopted this latest iteration of the development policy, the Sustainable Development Goals (“SDGs”), which replaced the Millennium Development Goals of 2000. In the context of production and consumption, Sustainable Development Goal 12 “Sustainable Consumption and Production” noted a need to shift policies and practices for business and industry to change in order to increase sustainability through changes to production and product design, as well as noting the potential economic gains to be had by resource and energy efficiencies.

The United Nations SDGs also raised awareness about the potential of sustainable infrastructure. It urged member states to address air, water, and soil pollution to minimise their countries’ impact on the environment (UNDP, 2015). The later greenhouse gas focused Paris Climate Agreement (COP 21), along with Resolutions 1/5 and 2/7 on chemicals and waste, and Resolution 2/8 on

sustainable production and consumption, of June 27, 2014 and May 27, 2016 respectively, are also important policy instruments relating to the circular economy agenda.

These international, intergovernmental commitments to sustainable development, consumption and production have generated increased regulatory pressures on governments to regulate their industries and to improve corporate environmental practices. Indeed, in 2014, the European Union (EU) Commission anticipated that, “new business models, eco-designs and industrial symbiosis can move the community toward zero-waste; reduce greenhouse emissions and environmental impacts” (EU, 2015).

Eventually, in March 2017, the EU Commission and the European Economic and Social Committee organised a Circular Economy Stakeholder Conference, where it reported on the delivery and progress of some of its Action Plans. It simultaneously established a Finance Support Platform in collaboration with the European Investment Bank (EIB) and issued important guidance documents to Member States on the conversion of waste to energy.

There have been several other EU Communications on this subject, including:

- "Innovation for a sustainable future - The Eco-innovation Action Plan";
- "Building the Single Market for Green Products: Facilitating better information on the environmental performance of products and organisations";
- "Green Action Plan for SMEs: enabling SMEs to turn environmental challenges into business opportunities";
- "Closing the loop –An EU action plan for the Circular Economy" and the report on its implementation, and

- "Investing in a smart, innovative and sustainable Industry - A renewed EU Industrial Policy Strategy", among others (EU, 2017).

More recently, the EU Commission adopted a set of measures focused on the use of plastics. These include the document a “Strategy for Plastics in the Circular Economy” which stipulated that all plastic packaging must be recyclable by 2030. It has further released a communication on the interaction among chemical, product and waste regulations. In support of these policy initiatives, the EU Commission launched a Monitoring Framework to be used to assess the progress of its member states towards the circular economy. This framework comprises ten key indicators: 1) EU self-sufficiency for raw materials; 2) Green public procurement; 3a-c) Waste generation; 4) Food waste, 5a-b) Overall recycling rates, 6a-f) Recycling rates for specific waste streams, 7a-b) Contribution of recycled materials to raw materials demand, 8) Trade in recyclable raw materials, 9a-c) Private investments, jobs and gross value added, and 10) Patents.

## **Conclusion**

Many actors including national governments to inter- and non-governmental organizations as well as industry associations have formulated policies and recommendations on sustainable development and on responsible production and consumption (Camilleri, 2015; Camilleri, 2020; UNDP 2015; UNCSD 2012). Nevertheless, potential challenges remain for the implementation of the circular economy’s closed loop and product service systems.

The economic implications of the development and implementation of circular economy systems pose a distinct challenge to industry practitioners and to many governments. As a result, there are

significant calls for contributions from government to provide economic support through subsidies and tax breaks to businesses, to help them invest in circular economy systems.

## References

- Agenda 21 (1992). United Nations Conference on Environment & Development. Rio de Janeiro, Brazil, 3 to 14 June 1992. United Nations SustainableDevelopment. <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>. (Accessed 5th February 2020).
- Camilleri, M. (2014). Advancing the sustainable tourism agenda through strategic CSR perspectives. *Tourism Planning & Development*, 11(1), 42-56.
- Camilleri, M.A. (2015). Valuing Stakeholder Engagement and Sustainability Reporting. *Corporate Reputation Review*, 18 (3), 210-222.
- Camilleri, M. A. (2017). Case Study 5: Closing the Loop of the Circular Economy for Corporate Sustainability and Responsibility. In *Corporate Sustainability, Social Responsibility and Environmental Management* (pp. 175-190). Springer, Cham.
- Camilleri, M. A. (2019). The circular economy's closed loop and product service systems for sustainable development: A review and appraisal. *Sustainable Development*, 27(3), 530-536.
- Camilleri, M. A. (2020). European environment policy for the circular economy: Implications for business and industry stakeholders. *Sustainable Development*, 28(6), 1804-1812.
- Cooper T. (Ed.). 2012. Longer lasting products: alternatives to the throwaway society. Gower Publishing: Surrey, England.
- Ellen MacArthur Foundation, (2013). "Circular Economy" <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview> (accessed 4 April, 2022).
- EMF (2013). Towards the Circular Economy. <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf>
- EU (2015) 'Closing the loop - An EU action plan for the Circular Economy', Communication from the Commission to the European Parliament, the Council, The European Economic and Social Committee and the Committee of the Regions. <http://eur-lex.europa.eu/legalcontent/EN/TXT/HTML/?uri=CELEX:52015DC0614&from=EN>
- EU 2017. Council conclusions on eco-innovation: enabling the transition towards a circular economy. European Council of the European Union, Brussels, Belgium. <http://www.consilium.europa.eu/en/press/press-releases/2017/12/18/council-conclusions-oneco-innovation-transition-towards-a-circular-economy/#> (accessed 5th February 2020).

EU 2018. Implementation of the Circular Economy Action Plan. European Commission. [http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm) (accessed 5th February 2020).

Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: a comprehensive review in context of manufacturing industry. *Journal of Cleaner Production*, 115, 36-51.

National Oceanic and Atmospheric Administration, Mar 29, 2022  
<https://marinedebris.noaa.gov/info/patch.html> (accessed 4 April 2022).

Porter, M. E. and Van der Linde, C. (1995) 'Green and competitive: ending the stalemate', *Harvard business review*, Vol. 73, No. 5, pp. 120-134.

Porter ME, Kramer MR. 2011. Creating Shared Value. *Harvard Business Review* 89(1): 62-77.

Shrivastava, P. (1995) 'The role of corporations in achieving ecological sustainability', *Academy of management review*, Vol. 20, No. 4, pp. 936-960.

Stahel, W. R. (2016) 'Circular economy: a new relationship with our goods and materials would save resources and energy and create local jobs', *Nature*, Vol. 531, No. 7595, pp. 435-439.

UNCSD (2012). Future we want—Outcome document. Resolution adopted by the General Assembly on 27 July 2012. United Nations General Assembly. [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/66/288&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/66/288&Lang=E).

UNDP (2015). Transforming our world. Resolution adopted by the General Assembly on 25 September 2015 [http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A\\_RES\\_70\\_1\\_E.pdf](http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf).

UNEP (2006) 'Circular Economy: An alternative model for economic development', United Nations Environment Programme. Paris, France.  
<http://www.unep.fr/scp/publications/details.asp?id=DTI/0919/PA> (accessed 25th October 2017).

WCED (1987). Our common future. In *World commission on environment and development*. Oxford, U.K: Oxford University press.

WSSD (2002). United Nations report of the world summit on sustainable development. Johannesburg, South Africa, 26 August- 4 September 2002. <http://www.un-documents.net/aconf199-20.pdf>.