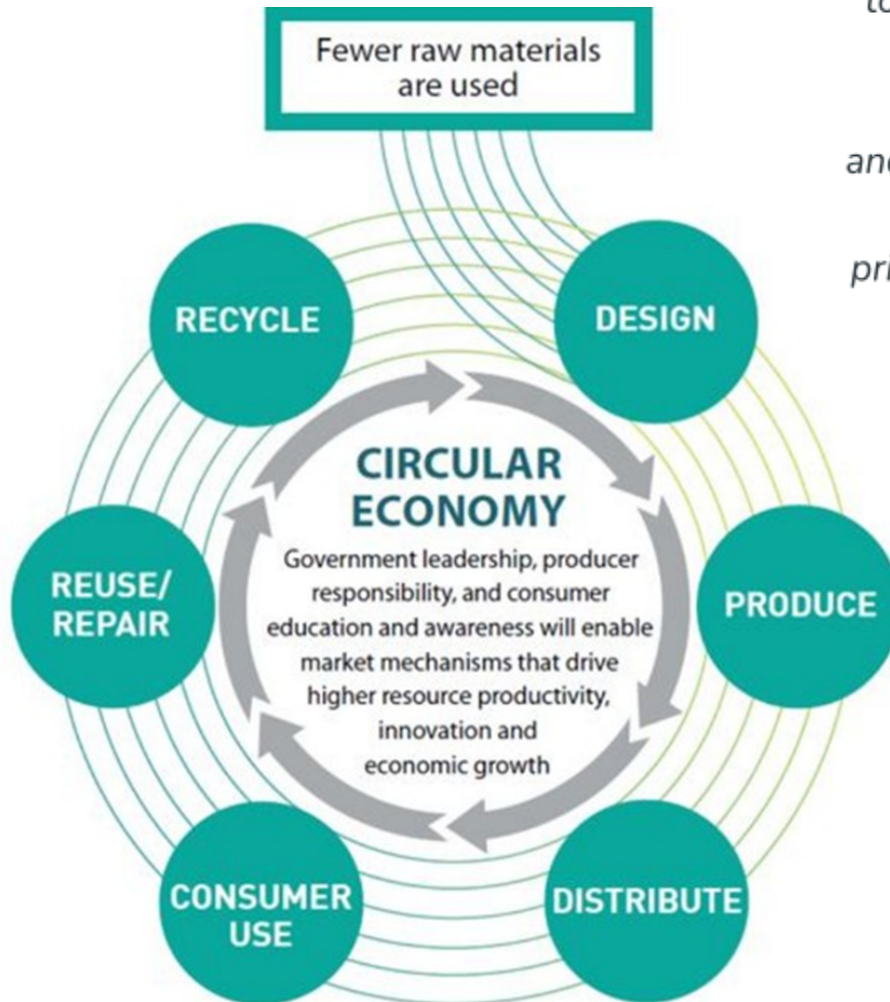




QUALITY INDEED
Consulting Ltd.

Linear to CIRCULAR ECONOMY

By adopting
ISO 14001 Standard



*"Organisations, committed to Circular Economy, need a **framework** for sustainability, and to institutionalise Circular Economy principles & practices in their business strategy, processes, governance and culture"*

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Overview

From the electronic gadgets we use, the food we eat, cars we drive or the homes we live in, we are continually using products and services which require a huge number of resources from the earth. While doing so, we pollute the environment, generate tons and tons of waste that keep on piling up in landfills. Given that 70% of all greenhouse gas emissions are associated with extracting raw materials from the earth and processing them, transitioning to a more sustainable model of producing and consuming goods is essential¹.

Sadly, very little of the waste generated gets reused or recycled. As per Circularity Gap Report 2022 from Ellen Macarthur Foundation, UK, of the 100 billion tonnes of resources that the world uses every year, only 8.6%² is cycled back into our economy. Over 90% of what we take from the earth to fulfill our needs and wants, goes to waste.

Our take-make-waste economy consumes 100 billion tons of materials a year and wastes over 90%"

– The Circularity Gap Report 2022

Today's manufacturing processes take raw materials from the environment and turn them into new products, which are then discarded into the environment after use. It's a linear process with a beginning and an end. The Linear economic model of "Take-Make-Use-Throw" is no longer sustainable.

Circular Economy

In a Circular Economy, products are designed for durability, reuse and recyclability. As much as possible, everything is reused, remanufactured, recycled back into a raw material which can be used to manufacture other products or as a last resort, disposed of.

Mottainai, was used as a slogan to promote environmental protection at the United Nations.

– By the environmentalist and Nobel Prize winner, Ms. Wangari Maathai

Mottainai – a term of Japanese origin – captures the true spirit and concept of Circular Economy. *Mottainai* conveys a sense of regret over waste or at the full value of something not being put to good use. Japanese environmentalists have used the term to encourage people to "reduce, reuse and recycle".

¹ <https://www.iso.org/contents/news/2022/11/ambition-for-the-new-economy.html>

² The Circularity Gap Report 2022

The Circular Economy concept is built on the principles of eliminating waste and pollution from the outset, keeping products and materials in use at their highest value, and regenerating natural systems. It involves:

- I. Designing environment friendly products and services;
- II. Using and circulating products and materials at their highest value;
- III. Designing for reuse and disassembly;
- IV. Reducing or eliminating waste and pollution.

Let's take a closer look at some of the elements one by one.

I. Designing environment friendly products and services

Design of products and services is critical for the circular economy as it affects almost all aspects of procurement, production, packaging, shipping, usage and disposal. In the circular economy, Design should consider such aspects as:

- *What happens after a product has been used?*
- *Does it become a waste?*
- *Can it be input for another product or industry?*
- *How to prolong the useful life of the product?*



Installation of Shigeru Ban's Paper Partition Systems for Ukrainian Refugees.
Image © Serhii Kostianyi

One of the very innovative and inspiring examples is of Pritzker Prize-winning Japanese architect, Mr. Shigeru Ban. He has developed the Paper Partition System (PPS)³ using recycled paper tubes of variable length and thickness for refugee shelters housing. The PPS can be quickly and easily installed and dismantled without polluting the environment. Mr. Ban's PPS system has been widely used for refugees from the Rwandan genocide in 1994;

for victims of the 1995 Kobe earthquake in Japan; shelters in Ukraine, Poland, France etc.

II. Using and circulating products and materials at their highest value

Ascend Elements Inc.⁴, USA manufactures advanced battery materials using valuable elements reclaimed from discarded lithium-ion batteries with up to 98% recovery rate, 90% lower greenhouse gasses (GHG) and lower cost. These materials are

³ <https://www.dezeen.com/2022/04/08/shigeru-ban-paper-partition-system-ukraine-refugee-shelter/>

⁴ <https://ascendelements.com/>

cheaper and of a higher quality than those mined from the earth. To learn more, watch the simple and very interesting clip on <https://youtu.be/7Ojpe3s1asE>.

Similarly Groupe Renault, one of the largest producers of automobiles, has established 'RE: Factory' in Flins, near Paris – Europe's first dedicated Circular Economy factory⁵ in collaboration with its large network of partners, supporting circular economy innovation across the full life-cycle of vehicles. In Re-Factory, Groupe Renault will:



Refactory by Renault Group – Europe's first circular economy factory for vehicles.
Photo by Laurent Lacoste

- 'Re-trofit'
Recondition vehicles, converting thermic vehicles to less carbon intense versions;
- 'Re-energy'
Optimize the first life of batteries, give used batteries a second life and manage end of life batteries and the exploration of new energy sources such as hydrogen.
- 'Re-cycle'
Dismantle end-of-life vehicles, remanufacture the parts, reuse and recycle materials.

III. Designing for reuse and disassembly

Adidas, one of the world's largest producers of shoes, describes its UltraBoost Loop as *"the shoes customer will never own – but will instead return once they are finished with them"*. The company says:

"If the end can become the beginning, we can help keep products in play and waste out of landfill" - Adidas

In another interesting example Gerrard Street, pioneers of service for its modular headphones has developed a Subscription Model which allows Gerrard Street to recover and recycle headphones at the end of their life. A simple cable breakage can render the headphone worthless leading to frustration among users. Gerrard's modular design of headphones allows 85% of components to be reused.

⁵

<https://media.renaultgroup.com/groupe-renault-creates-the-first-european-factory-dedicated-to-the-circular-economy-of-mobility-in-flins/>

Management System Standard for Circular Economy

Organizations committed to Circular Economy need a framework for sustainability and to institutionalize Circular Economy principles & practices in their business strategy, processes, governance and culture.

Recognising the need and importance for such a framework, the International Organization for Standards (ISO), Geneva has started work on drafting the same. Under the leadership of Catherine Chevauché, ISO has established Technical Committee 323

(TC 323) for developing the first International Standard for the Circular Economy. It is expected to be published by the beginning of 2024⁶.

For the first time, a set of International Standards for the Circular Economy – which define it, set out how to transition to it, and how to measure success - is being written.

– ISO, Geneva

From the release of ISO standards for Circular Economy to its socialization, widespread adoption can easily take years.

In the meantime, organizations desirous to start their Circular Economy now, can consider adapting readily available international Environment Management System Standards – ISO 14001 (EMS).

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ISO 14001 provides organizations, of all types and sizes, with a framework to protect the environment and respond to changing environmental conditions in balance with socio-economic needs. It provides a ready, relevant and robust management system framework for organizations to adopt and

adapt principles and practices of Circular Economy.

Let me demonstrate, with a few requirements of ISO 14001, on how organizations can adapt their policies and processes to implement concepts and principles of Circular Economy in their business strategy and routine work.

⁶ <https://www.iso.org/contents/news/2022/11/ambition-for-the-new-economy.html>

ISO 14001 Requirements

0.2 Aim of an Environmental Management System (EMS):

- To protect the environment by preventing or mitigating adverse environmental impacts;
- To mitigate the potential adverse effect of environmental conditions on the organization;
- To control or influence the way the organization's products and services are designed, manufactured, distributed, consumed and disposed by using a life cycle perspective that can prevent environmental impacts from being unintentionally shifted elsewhere within the life cycle.

It is clear that the above aims set out in the ISO 14001 are well aligned with the concepts and principles of Circular Economy.

5.1 Leadership and Commitment

As with any major sustainable transformational initiative, success of the Circular Economy, and EMS also depends on commitment from all levels and functions of the organization, led by its leadership.

As per requirement 5.1 of ISO 14001, *"Top management requires to demonstrate leadership and commitment to the EMS by taking accountability for the effectiveness of the environmental management system"*.

A good example of this is from Royal Dutch Philips Company.

In 2012, Mr. Frans van Houten, CEO of Royal Dutch Philips took the bold step of embedding Circular Economy explicitly into Philips' strategy, justifying this decision using both a business rationale of increased competitiveness, cost savings and better customer relationships, as well as the need to do business responsibly in the light of environmental impact and finite resources⁷.

"Working on healthy people and a healthy planet are two sides of the same coin",

**– Harald Tepper,
Circular Economy Program Lead at Philips**

⁷

6.2 Environmental Aspects

Requirement 6.2 states that an “organization needs to determine the environmental aspects of its activities, products and services that it can control and those that it can influence, and their associated environmental impacts, considering a life cycle perspective”.



Carbon-negative cement produced by Brimstone Energy reduces emissions and costs less than conventional. Photo by Anaya Katlego on Unsplash

Cement, one of the most used materials on the planet, is a huge source of global emissions – about 7.5%, which is nearly the amount of emissions produced by all of the cars on the road. Conventionally cement is made from carbon-heavy limestone which releases CO₂ when processed. Brimstone Energy, a start-up aiming to commercialize affordable carbon-negative cement, has achieved breakthrough in the industry by producing portland cement with carbon-free calcium silicate rock instead of limestone. The good news is calcium silicate is a hundred times more abundant than limestone.

8.1 Operational Planning and Control

This is a very important requirement with far reaching consequences for climate. It states that organizations “shall establish controls, as appropriate, to ensure that its environmental requirements are addressed in the design and development process for the product or service, considering each life cycle stage”.

Product design stage is especially important, as:

1. over 70% of a product’s life cycle costs and environmental footprint is determined during its design phase⁸;
2. it is hard to reverse the impacts of design decisions once they are implemented.

The textile industry uses vast quantities of water and chemicals and produces large quantities of toxic waste. Dutch company DyeCoo has developed a process of dyeing cloth that uses no water at all, and no chemicals other than the dyes themselves. It uses highly pressurized “supercritical” carbon dioxide, halfway between a liquid and a gas, that dissolves the dye and carries it deep into the fabric. The carbon dioxide then evaporates, and is in turn recycled and used again. 98% of the dye is absorbed by the cloth, giving vibrant colors. And because the cloth doesn’t need to dry, the



DyeCoo CO₂ technology – an innovative example of addressing the environmental issues in the product design.

⁸ “Frugal Innovation: How To Do More With Less”, Navi Radjou and Jaideep Prabhu

process takes half the time, uses less energy, and even costs less. The company already has partnerships with major brands like Nike and IKEA.

8.1 (d) Operational Planning and Control

As per the requirement 8.1(d) of ISO 14001, organizations *“need to provide information about potential significant environmental impacts associated with the transportation or delivery, use, end-of-life treatment and final disposal of its products and services”*.

The Chemical Leasing project started in Serbia in partnership with the United Nations Industrial Development Organization (UNIDO) is a great innovative example where chemicals are leased rather than purchased in a cooperation between chemical producers, suppliers and users. This innovative operating model not only helps reduce resource consumption, waste and emissions to air and water but also ensures safe disposal of chemicals (resources) at the end of a product's life⁹.



Chemical Leasing is a performance-based business model for sustainable chemicals management.

Companies like Royal Dutch Philips Company, Brimstone Energy, DyeCoo, UNIDO, quoted above, may not have used ISO 14001 framework to kick start their Circular Economy way. Linking sample EMS requirements to these examples demonstrates that we have a reasonably relevant framework to embed principles and practices of Circular Economy until the new standard fully focused on Circular Economy is published in 2024.

Conclusion

A growing number of small, medium and large companies from all over the world are integrating Circular Economy principles and practices into their business strategy. While we are waiting for ISO, Geneva to publish the first international standard for the Circular Economy, thousands of organizations who have already implemented ISO 14001 standards can easily adapt their Environmental Management System to embrace Circular Economy, help fight climate change and become a role model for other organizations.

Moving towards the Circular Economy is the key and a **trillion-dollar opportunity** with huge potential for innovation, job creation and economic growth.
– According to the World Economic Forum

⁹ <https://chemicalleasing.com/chemical-leasing-in-practice/>



About the author

Mr. Sunil Thawani champions The United Nations Sustainable Development Goals (SDGs) 2030. He is a recipient of prestigious ASQ Lancaster Medal for his dedication and outstanding contributions to the International Fraternity of Quality Professionals. He lives in Abu Dhabi and can be reached at contact@qualityindeed.com