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ABDULLAH BIN HAMAD AL-ATTIYAH INTERNATIONAL FOUNDATION
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Expert sustainability opinion and insight

Circular Economy:

How to Grow a Sustainable Economy

The term "Circular Economy" has become a byword for a good economic model for "Sustainable Development". The concept has gained common acceptance and recognition as a more sustainable economic model and more desirable than the previous linear approach to economic planning. Whereas the philosophy behind a Circular Economy, developed in the 1960s, was ridiculed, with the evolution of sustainable development, it has since grown in acceptance and effectiveness for catalysing sustainable economic growth.

This historical evolution and growth, however, should not divert attention from the challenges that still remain in moving from just a theoretical concept into a global tool for formulating sustainable economic policies. The term circular economy has indeed become a household term, however, its interpretation differs across geographies and economic sectors.

This paper serves to explain the concept of a Circular Economy; the schools of thought behind it; its evolution from linear economy; and the application of the concept in Qatar, particularly in the context of the Qatar National Vision 2030 (QNV2030).

Executive Summary

- The term "Circular Economy" is now closely associated with Sustainable Development as it introduces a methodology for reducing consumption of non-renewable resources.
- Lots of examples of individual initiatives but these are general on a small scale as yet.
- Many reasons for adopting the "Circular Economy" approach within Qatar. These are generally all in line and support Qatar Vision 2030.

What is a Circular Economy?

Looking beyond the current take-make-dispose extractive industrial model, a Circular Economy aims to redefine growth, focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources, and designing waste out of the system.

The linear economy could be viewed as a model of delivering goods to the consumer by simply following the processes of: extract; and/or manufacture; and/or produce; use; and dispose. The Circular Economic model, on the other hand, is underpinned by a transition to renewable energy sources, and based on three principles:

A. Design out waste and pollution;

B. Keep products and materials in use; and

C. Regenerate natural systems.

FIG 01 : What is a Circular Economy?

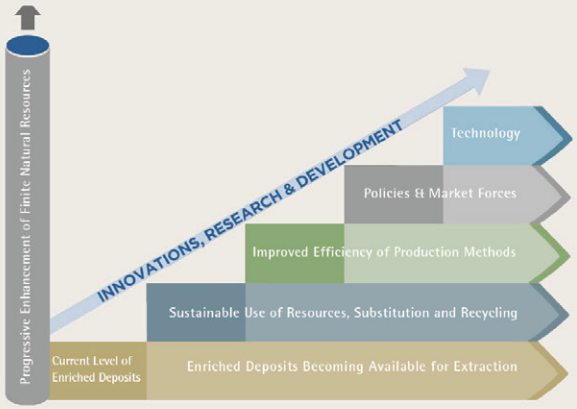
Circular economy is characterized by the following objectives:

- To make resource use more efficient;
- To reduce the production of waste;
- To maximise the recycling of waste; and
- To identifying alternative business models.

A Circular Economy is an alternative to a traditional linear economy, in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products.

In the context of finite natural resources like oil and gas, in particular, the concept of a Circular Economy includes enhancing the longevity of the value of finite resources for the benefit of future generations. The progressive enhancement of the value and longevity of finite natural resources (see figure below), including their conversion to other forms of sustainable assets, could be interwoven or integrated into any appropriate phases of the above cyclic process to form a well-developed and mature circular economy.

FIG 02 : Progressive Enhancement of Finite Natural Resources.



Some early examples of initiatives, promoting the concept of a Circular Economy, include:

1. Developing solutions for recycling PET drinks bottles and overcoming significant technological barriers to produce food grade recycled HDPE for milk bottles;
2. Development of recycling processes for mixed plastics such as yoghurt pots and margarine containers;
3. Working to change consumer behaviour and supporting local collections, increasing the recycling rate of plastic bottles from 5% in 2000 to 48% in 2011;
4. Providing financial support to develop processing infrastructure;
5. Investment in the development of human capital and technology; and
6. Promoting economic diversification.

Technological and Biological Cycles

In Circular Economy model, there is clear distinction between technical and biological cycles. Consumption happens only in biological cycles, where food and biologically-based materials (such as cotton or wood) are designed to feed back into the system through processes like composting and anaerobic digestion.

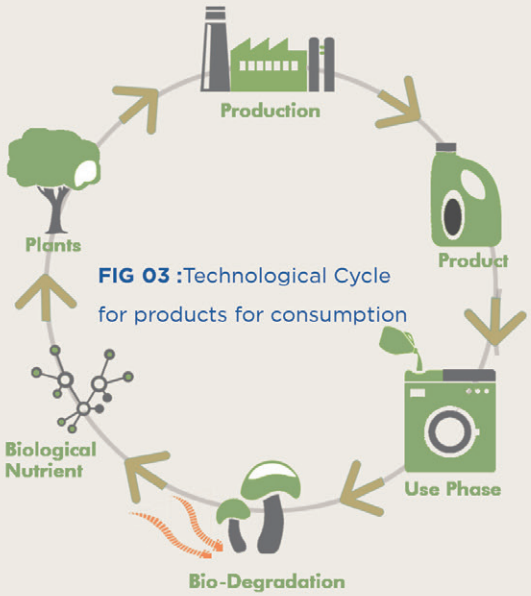


FIG 03 : Technological Cycle for products for consumption

These cycles regenerate living systems, such as soil, which provide renewable resources for the economy. Technical cycles, on the other hand, involve the recovery and restoration of products, components, and materials through strategies like reuse, repair, remanufacture or (in the last resort) recycling. However, it is worth noting that, depending on the economic sector and the industrial/ production processes and consumption patterns involved, it is common to have integrated technical and biological cycles.

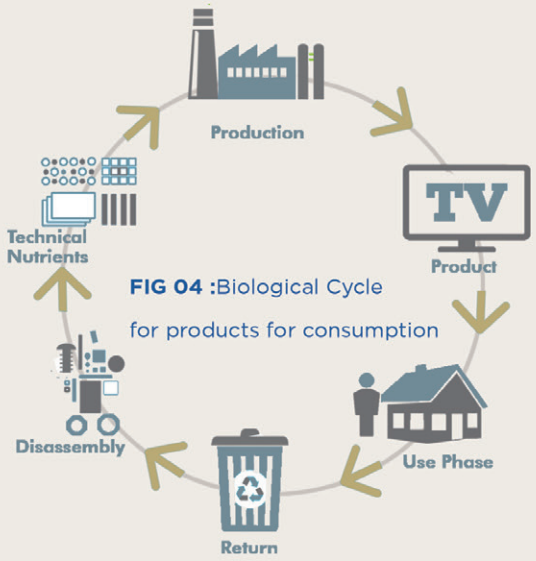


FIG 04 : Biological Cycle for products for consumption

Circular Economy Schools of Thought

The notion of circularity has deep historical and philosophical origins. The idea of feedback, of cycles in real-world systems, is ancient and has echoes in various schools of philosophy.

It enjoyed a revival in industrialised countries after World War II when the advent of computer-based studies of non-linear systems unambiguously revealed the complex, interrelated, and therefore unpredictable nature of the world we live in – more akin to a metabolism than a machine. With current advances, digital technology has the power to support the transition to a circular economy by radically increasing virtualisation, de-materialisation, transparency, and feedback-driven intelligence.

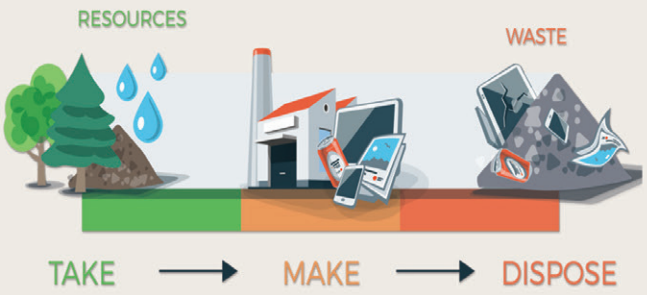
The Circular Economy model is a synthesis of several major schools of thoughts, that include:

1. The functional service economy (performance economy) of Walter Stahel;
2. The Cradle to Cradle design philosophy of William McDonough and Michael Braungart;
3. Biomimicry as articulated by Janine Benyus;
4. The industrial ecology of Reid Lifset and Thomas Graedel;
5. Natural capitalism by Amory, Hunter Lovins and Paul Hawken; and
6. Blue economy systems approach described by Gunter Pauli.

From a Linear to a Circular Economy

The world population is growing and this is affecting the environment. To ensure there's enough food, water and prosperity in 2050, we need to switch from a Linear to a Circular Economy. For a long time, our economy has been 'linear'. This means that raw materials are used to make a product, and after its use any waste (e.g. packaging) is thrown away.

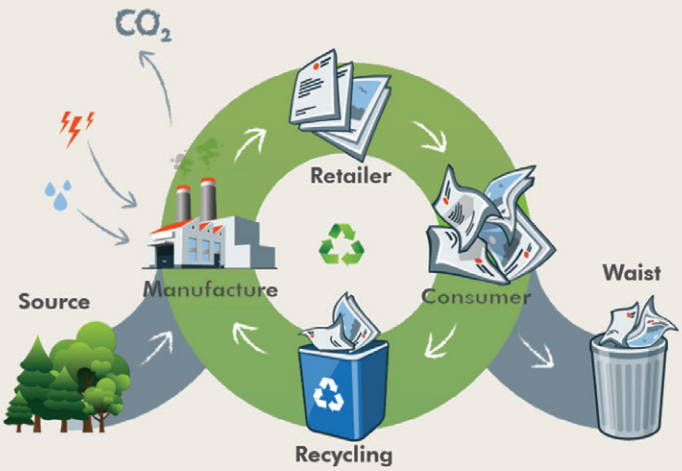
FIG 06 : Linear Economy Concept.



In an economy based on recycling, materials are reused. For example, waste glass is used to make new glass and waste paper is used to make new paper. To ensure that in the future there are enough raw materials for food, shelter, heating and other necessities, our economy must become circular. That means preventing waste by making products and materials more efficiently and reusing them. If new raw materials are needed, they must be obtained sustainably so that the natural and human environment is not damaged.

In a circular economy, manufacturers design products to be reusable. For example, electrical devices are designed in such a way that they are easier to repair. Products and raw materials are also reused as much as possible. For example, by recycling plastic into pellets for making new plastic products. Adopting a Circular Economy model also helps us to treat our surroundings responsibly. For example, by preventing litter on streets or in the natural environment.

FIG 05 : Circular Economy Concept.



Moreover, moving towards a Circular Economy helps policy makers and influencers adopt policies that ensure that the conversion of finite natural resources into social, human and economic capita, is fully optimized.

How is Qatar Moving Towards a Circular Economy?

Qatar National Vision 2030.

The launch of the Qatar National Vision 2030 (QNV 2030) in 2008, helped to consolidate the efforts of the State of Qatar to focus on sustainable development since her independence in 1971. The efforts include, the establishment of development-oriented institutions and authorities, such as, the Supreme Planning Council, General Secretariat for Development Planning and Ministry of Development Planning and Statistics.

The QNV 2030, with its four pillars (Human Development, Social Development, Economic Development and Environmental Development), is aimed at changing the face of life in Qatar. It formed the cornerstone of the implementation by the State of Qatar, of the 2030 Agenda and the subsequent UN Sustainable Development Goals. It underpinned Qatar's efforts to build a modern state with sustainable, integrated economic, social and environmental development that leverage the available human and material resources to ensure a better future for all the citizens and residents of Qatar.

Qatar's sound management of its bountiful hydrocarbon resources will continue to secure improvements in standards of living. However, an improved standard of living cannot be the only goal of a society. To remain true to its values, Qatar Vision 2030 must balance five major challenges:

1. Modernization and preservation of traditions;
2. The needs of this generation and the needs of future generations;
3. Managed growth and uncontrolled expansion;
4. The size and the quality of the expatriate labour force; and
5. Environmental management.

Qatar is committed to meeting the needs of both present and future generations. Sustainable development is a process that seeks to meet the needs of the present generation without compromising the ability of future generations to meet their needs. This is often called intergenerational justice. The rights of future generations would be threatened if the depletion of non-renewable resources were not compensated by the creation of new sources of renewable wealth. This could happen in at least three ways.

First, the financial returns from hydrocarbon wealth could be used inefficiently, delivering low returns. Second, spending on "trophy" or conspicuous projects could prove costly. And, thirdly, overly aggressive economic development could lead to economic overstress and risk, tipping the environmental scales irreversibly. Qatar's National Vision chooses the development path that carefully balances the interests of the current generation with the interests of future generations.

Economic development and protection of the environment are two demands - neither of which should be sacrificed for the sake of the other. Development patterns can, and often do, have negative effects on the natural environment. Environmental degradation can be reduced through investment in advanced technologies designed to minimize the damage caused by economic activities. It can also be reduced by avoiding rapid and unplanned growth. Even with Qatar's best efforts, it is impossible to entirely avoid harming the environment, given a development pattern that depends in its early stages on oil, gas, petrochemicals and heavy industries.

Qatar has already committed to enforcing international standards for environmental protection when designing and implementing its industrial projects. The country is also committed to making its future path of development compatible with the requirements of protecting and conserving the environment. Wherever there is an environmental cost to be paid for economic progress, it must be compensated with investments in technologies that help improve the environment.

Therefore, in pursuit of its sustainable development efforts, the government of Qatar provides a supportive environment to enable the private sector launch initiatives that help to promote long term sustainable growth. It is encouraging to see companies, particularly energy companies, responding well to the efforts of governments, in public-private-partnership, to adopt the circular economy model that would ensure that the four pillars of Qatar National Vision 2030 are continued to be properly addressed

Why is a Circular Economy Important?

As well as creating new opportunities for growth, a more circular economy will help to:

1. Reduce waste;
2. Drive greater resource productivity;
3. Reduce the environmental impacts of production processes and consumption patterns;
4. Provide for the needs of future generation.

In a Circular Economy, economic activity builds and rebuilds the health of the overall system of economic activities. The concept recognises the importance of the economy needing to work effectively at all scales – for large and small businesses, for organisations and individuals, globally and locally.

Transitioning to a Circular Economy does not only amount to adjustments aimed at reducing the negative impacts of the linear economy, but also involves a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits.

Effect of a move towards a Circular Economy for Developing Countries

A transition towards a 'Circular Economy' - in which redundant consumer goods are viewed as input rather than waste - offers great potential for societies to reduce their environmental footprint. Once products reach the end of their lifespan new value can be generated by re-using valuable resources. This has some economic benefits for developing countries that depends on imports of manufactured products, and is detrimental to those countries that rely heavily on revenues from exports of natural resources.

In today's globalized world, widely used (consumer) goods such as mobile phones, are generally composed of resources and materials from all corners of the world. For example, in 2014, Brazil was the largest exporter of iron ore to the EU. Lithium, a key component of batteries, is mostly imported from the US. And nearly half of aluminium ores and concentrates imported by the EU come from Guinea. Various economic sectors in Europe (e.g. aerospace, renewable energy, technology, etc.) are highly dependent on the availability of specific sets of raw materials.

However, in spite of the strong interconnectivity between export markets and countries of origin, insufficient attention is paid to the consequences that a transition to circularity may have on countries that rely on the export of raw materials for (economic) stability, in particular developing countries. After all, a Circular Economy could, by default, result in reduced revenues for resource-exporting developing countries.

There is an unfortunate increase in the trend of using underdeveloped countries as dumping grounds for consumer waste, even as part of recycling processes. This is further compounded by the fact that, in certain resource rich, exporting countries, there is often a lack of good governess, strong institutions, business-friendly regulations, and policies.

Organisation of Markets

The rising demand for natural resources including energy, minerals and agricultural products, has been driven mainly by population growth in developing countries and an improvement in living standards in many countries around the world. Various factors however, serve to limit the availability of natural resources. First of all, resources are not equally distributed across the globe. Secondly, there are serious environmental consequences, such as climate change, to expanding production and consumption of natural resources. Thirdly, natural resource extraction and exports can be hampered by armed conflict. Finally, large exporters at times choose to restrict the export of certain commodities, for instance to promote domestic growth.

Open, transparent, and well-functioning markets for metals, minerals and other natural resources are essential for ensuring access to supply and to safeguard the economic wellbeing of nations worldwide. However, corruption, political instability and violence are factors that act as important constraints to growth in the production of natural resources and cause economic pain in countries that depend on their import.

The Circular Economy in Qatar

While the economy in Qatar is primarily characterized by extract and sell, there are a few overriding factors that bode well for the building and nurturing a Circular Economy. These factors include:

- Significant efforts on energy efficiency. Energy saved means that energy can be sold;
- Use of revenue from energy sales to build a sustainable modern state;
- The production base is very much lower than the consumption base so that the consumer economy is overwhelmingly an importing one;
- Useable land is limited and consequently landfill for disposal is limited. Recycling, therefore, helps to avoid the proliferation of landfill sites;
- Atmospheric pollution is already high in Qatar. Incineration of waste needs to be limited and recycling will reduce the need for incineration.

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