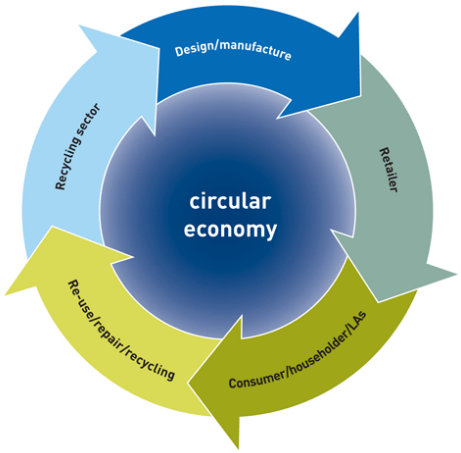
Practicing Circular Economy

What is circular economy?

- A circular economy is an alternative to a traditional linear economy (make, use, dispose).
- It is the economy in which people keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life
- CE is fundamentally a prescription for creation of a highly resource efficient economy where carbon footprint will get automatically reduced.
- As for metals, CE prescription is that when products reach their end of life, they should be productively used again by way of recirculation and recycling.



- CE goes beyond end-of-life metal products recycling to the use of by-products such as steel slag for cement making and laying of roads and pavements.

How metal production using circular economy practice can reduce the GHG emissions?

- Steel alone is responsible for a quarter of global greenhouse gas emissions of all industries.
- This is in spite of the steel sector achieving significant improvements in efficiency in use of raw materials and energy and scrap recycling over the years.

- Steel scrap recycling through electric arc furnaces (EAF) constituted 28 per cent of the global steel production of 1.69 billion tonnes (bt) in 2017.
- The EAF route of making steel requires 56 % less energy than when the metal is produced from iron ore.
- As for aluminium, scrap recycling will require just about 5 % of the energy used in smelting primary metal from alumina, which in turn is refined from bauxite.
- Aluminium presents an interesting case where carbon emissions have a direct link with its production.
- Carbon emissions are at the lowest at 1 tonne CO2 per tonne of metal when aluminium is derived by way of scrap recycling.
- These go up to 3 tonne per tonne of primary aluminium when modern smelters use hydro power.
- But smelters using coal-fired electricity are responsible for emitting CO2 of up to 20 tonne per tonne of aluminium.
- India's entire 4.1 million tonne (mt) aluminium smelting capacity is thermal power based.
- Therefore, the smelters here leave a bigger carbon footprint than the ones using electricity derived from hydro and natural gas resources.

What is the global scenario?

- CE is a concept that promotes an industrial system regenerative in nature.
- In a circular economy, products are designed for ease of reuse, disassembly and refurbishment, or recycling.
- CE will prompt decoupling of economic growth and materials inputs.
- Even while CE is in practice in select countries for around a decade, discussions on the subject are still focused on recycling of metal products and finding use for by-products.
- Accelerating the transition from a linear to CE will demand of industry giving sufficient attention to circular design (CD) that will allow remanufacture and reuse of steel products in application in construction, machinery, automobiles and ships.
- The world wants to move to a more resource efficient and an increasingly less CO2 emitting economy.
- Aluminum smelters in China draw 90 % electricity from thermal stations and 10 % from hydro units.
- Surprisingly, China, the world's largest source of planet warming carbon emissions, was among the first countries to be off the block to introduce CE policy regulations in 2008.
- The European Union followed suit in 2013.
- CE practices are steadily gaining ground in the US and several other

countries trying to clean up the environment.

What is the present scenario in India with respect to CE?

- India is still to be awakened to the benefits inherent in the concept.
- However Tata Steel has dropped hints that the company will remain in pursuit of capacity build-up through brown field route and acquisition of distressed assets and it also progressively embrace circular economy practices.

What are the facilitating steps that can nourish the CE practices?

- CE practices will flourish in a regulatory environment that ensures the viability of circular businesses.
- Benefits by way of optimal resource use, energy savings and low carbon emissions are inherent in a CE.
- But industry will need a supportive environment to make investments in creating CD facilities.
- Also need business friendly guidance in setting up remanufacturing units and market promotion of remanufactured goods for any country to reap sustainable CE benefits.

Source: Business Standard